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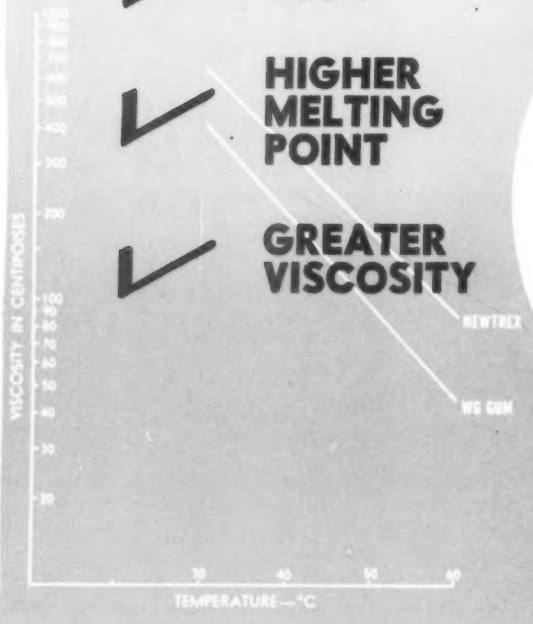

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TYPICAL ANALYSIS

COLOR	WG-WW
MELTING POINT (Cap)	68°C
MELTING POINT (B&R)	93°C
ACID VALUE	162
SAPONIFICATION VALUE	168

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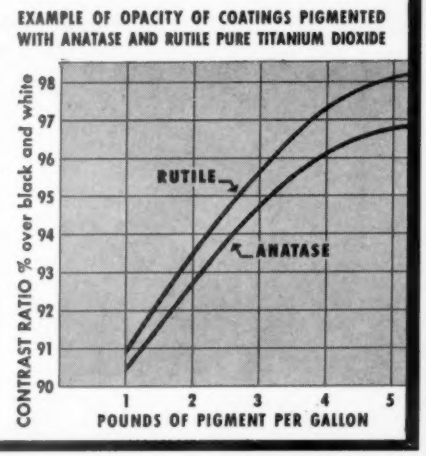
SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

Technical Tips from Titanox

Q. ***What determines the choice between anatase and rutile types of pure titanium dioxide pigments?***

A. ***The type of coating.***



• The superior hiding power and ease of mixing and grinding of rutile pure titanium dioxide pigment have won preference for it over the anatase type for many kinds of coatings. (The accompanying chart presents an example of the superiority in hiding of rutile as indicated by opacity of enamels at constant spreading rate.)

Yet the dominance of rutile over anatase is not complete, for in a few types of coatings, properties imparted only by anatase, under the conditions encountered, are often desired.

Whether an anatase or rutile type of TITANOX is to be used is governed largely by the class of coating being made, thus:

Industrial Product Finishes—white and light tinted — TITANOX-RA — multi-purpose *rutile* pure titanium dioxide imparts high gloss, whiteness, whiteness retention, color retention, reduced chalking and maximum coverage.

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A long standing preference for anatase TITANOX-A-168 for maximum whiteness and its retention in the above classes of coatings is giving way to the greater hiding of TITANOX-RA plus equal whiteness after toning.

Tinted Exterior Finishes — highest quality and durability — TITANOX-RA-NC — "non-chalking" rutile pure titanium dioxide imparts high gloss, maximum reduction of fading-chalking, high opacity and uniformity of tints. This pigment is also used in interior-exterior finishes.

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NEXT ISSUE

The June issue will carry an interesting article on various test methods developed and employed by the Bell Telephone Laboratories in evaluating protective coatings. Test results will be presented to indicate the usefulness of selected testing techniques in comparative studies to establish the most suitable materials for a particular job, and also to demonstrate their applications to the solution of finishing problems which arise in production.

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Editorial Comment

Rich and Fascinating

"THE FIELD ahead is rich and facinating." These were the closing words of an address by Dr. J. S. Long of the Devoe and Raynolds Co., Inc., at the American Chemical Society Spring Meeting held recently in Philadelphia.

"For centuries basic carbonate of white lead ground in raw linseed oil was the standard," he said. This was thinned or mixed in some manner by the painter who had no accurate way of making comparisons or plotting curves of durability as related to composition. Considerations of pigment volume, free oil, spreading rates, film thickness, ultraviolet absorption, etc. were largely lacking. As soon as the chemist and chemical engineer entered the field, the concepts of physical chemistry were applied resulting in mixed pigment paints formulated by the chemist.

Similarly, the principles of chemical engineering began to creep in production methods. Take the case of the open varnish kettle used in the early days for producing bodied oils, varnishes, alkyds, etc. The quality of such products was often poor due to decomposition taking place on the bottom and the sides of direct fired kettles. By substituting Dowtherm heating for hot direct fires, this problem was virtually eliminated.

Organic synthesis has played an important part in providing new and improved raw materials for the paint industry. Azeotropic distillation during esterification reactions have been especially helpful. Resultant products made by this process are superior in color, speed of dry, water and alkali resistance, weathering, etc. Also, this process prevents decomposition, which is coincident with the molecular aggregation process, thus giving a more desirable curve for distribution of molecular species.

Alkyd resins were synthesized by accident in 1847. It was not until 1927 that the mechanism of polymerization of these resins was published. This led to the development of alkyds based on linseed and soya oils. With the wide acceptance of alkyds in marine and railroad finishes, architectural paints, floor finishes, etc., these resins were in constant demand. This resulted in the use of pentaerythritols and other polyhydricalcohols instead of glycerine in the formation of other types of alkyds.

The introduction of titanium pigments made it possible to incorporate great hiding power into paints and enamels. Recent vehicle processing developments have also made it possible to design one coat house paints which can be applied in film thicknesses of 3.75 and 4.0 mils in a single coat without sagging.

Finishes based on styrene-butadiene copolymers have created quite an interest in that they are fast drying, able to stand washing, have very little odor, and may be easily retouched. The work of the chemist in the field of water-thinned paints has been evidenced during recent months. Problems of shelf stability, emulsification, pigmentation, brushability were ironed out so that these types of paints would receive a wider acceptance by the public.

Chlorinated rubber paints have been successfully used for masonry. In the past oil-based paints powdered off under the action of the alkali in the masonry which caused saponification of the oil.

Paints containing DDT and other insecticides to kill flies, mosquitoes, bed bugs, roaches, and other insects should improve our national health. Since insects are capable of developing immunity for DDT paints, continued work by the chemist in developing the use of more powerful insecticides in our paints will be necessary.

Progress made in the chemical industry has resulted in improved coatings. For example: a new class of resins based on epichlorohydrin and bisphenol makes films of great toughness and resistance to alkalies and chemicals.

"New qualities and properties are coming in as a result of the efforts of the chemists and chemical engineers. And this is only the beginning. The field is rich and fascinating," as aptly said by Dr. Long.

THE sixth Annual Conference and Exhibition of The National Association of Corrosion Engineers held in St. Louis, on April 4–7, attracted some 1,000 guests and members. All activities including the technical sessions, exhibits, motion pictures, etc. were located at the Jefferson Hotel.

The National Association of Corrosion Engineers was organized in 1943 as a non-profit technical association, and its objects are: (a) To promote the prevention of corrosion, thereby curtailing economic waste and conserving natural resources. (b) To provide forums and media through which experience with corrosion and its prevention may be reported, discussed and published for the common good. (c) To encourage special study and research to determine the fundamental causes of corrosion, and to develop new and improved techniques for its prevention. (d) To correlate study and research on corrosion problems among technical associations to reduce duplication and increase efficiency. (e) To promote standardization of terminology, techniques, equipment and design in corrosion control. (f) To contribute to industrial and public safety by promoting the prevention of corrosion as a cause of accidents. (g) To foster cooperation between individual operators of metallic plant and structures in the joint solutions of corrosion problems. (h) To invite a wide diversity of membership, thereby insuring reciprocal benefits between industries and governmental groups as well as between individuals and corporations.

Papers Delivered

Thirty-one papers on the various phases of corrosion were presented during the technical sessions. Four of them were concerned with the prevention of corrosion through the use of protective coatings, and the importance of surface preparations for optimum performance of coatings in combating corrosion.

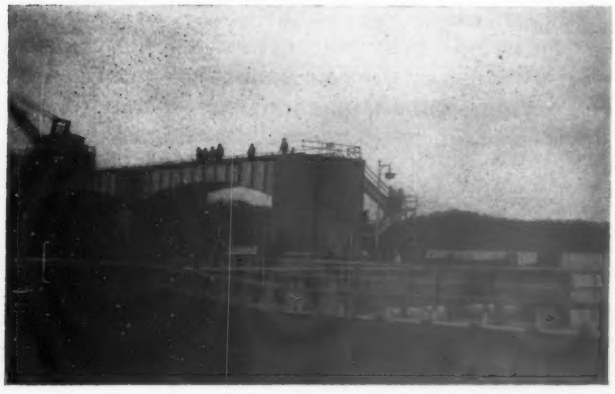
Selection of Organic Protective Coatings for Marine Use in Petroleum Production. Jack P. Barrett, Standard Oil and Gas Co., Tulsa, Oklahoma.

This paper gives a general outline of the principal conditions of exposure encountered in marine operations associated with petroleum production. The high cost of the marine or off shores wells makes a corrosion program imperative. A major part of this program is the use of organic protective coatings. This particular application is relatively new for most paint manufacturers and consequently a laboratory testing program was set up to evaluate protective coatings. To further verify the laboratory results, panels coated with the various painting systems were exposed at a marine location in the Gulf Coast. A laboratory testing program is described in which quantitative measurements of the film characteristics are made. By using the moisture vapor transission salt spray and adhesion tests, a laboratory rating is calculated by which coatings are rejected or further tested in the field. The better coatings together with some of the unsuitable ones were exposed on test

panels at a marine test station. Exposure was made in the atmospheric, tidal or splash zone and on totally submerged conditions. Correlation between the laboratory and the marine test station exposure is given as 91 per cent. Some thirty systems have been tested to date and approximately 60 per cent were totally unsuited for these exposure conditions. Twenty per cent were of doubtful value leaving twenty per cent that could be used with more or less effectiveness. It is concluded that the petroleum companies engaged in this work should outline a standard test program to be used in testing the materials submitted for the various exposures encountered.

Flame Sprayed Plastic Coatings. Bernard Goldberg, Schori Process Corp., Long Island City, N. Y.

The history of flame spraying was briefly reviewed. Both guns and powder containers used for applying flame sprayed coatings of plastic powders were described in some detail. Necessary criteria for organic materials both thermoplastic and thermosetting were indicated. Problems involved in producing suitable powders of tough non-friable resins were discussed and indications



Convention

National Association of CORROSION ENGINEERS

given of several promising solutions. Properties of flame sprayed Thiokol (a polysulphide synthetic rubber) coatings were reviewed in some detail. Recent work on improvements in flame spraying technique were illustrated by a discussion of the advances of the flame spraying of various polyethylene compounds. This included comments on current theory, various fuel gas combinations and polyethylene compounding for obtaining specific properties in flame sprayed coatings. Some data were presented on the effect of after-treatments of flame sprayed plastic coatings. Experimental work being done on producing flame sprayed coatings of fluorinated hydro-carbons were described, and a preliminary report given on the properties of these coatings. Recent developments in the technique for producing smooth non-porous coatings of hot melt compositions were also discussed in some detail.

Surface Preparation Values and Sandblasting Economics. A. J. Liebman, Dravo Corp., Pittsburgh, Pa.

This paper showed how surface preparations can be dependably and economically determined beforehand, and the total performance value of coatings either increased or decreased, depending on service requirements. An outline of all suitable surface preparation methods were given although the main emphasis was on preparation by sandblasting. Metal can be sandblasted by the dry or wet process in either an open or closed system. Present limited use of proper terminology and good selective interpretation of blasting work develops costs that can range from 5¢ to 40¢ per sq. ft. There is a need for some fluctuation, but in many cases greater initial economy is possible if real needs are understood. To properly interpret such needs, distinct practical dividing lines for blast finish classifications must be found. Presently, it is said "blast the surface and prepare for paint application." One operator interprets this as a job that can be covered at the rate of 350 ft. per hour; and another operator, at the rate of 100 ft. Because of this ambiguous meaning, many a blast job has to be done over. In other cases, a high priced job involves the removal of all scale and binder to the white metal which requires approximately one hour blasting per 100 sq. ft., yet the coating could have performed as well with the less costly removal of mill scale only. Further value is placed on blast sand selection. Some sands produce a high initial breakdown. The ultimate production and surface quality depends largely on well selected sand. Sand grain size is also important, especially where a thin coating is contemplated. With present labor costs, equipment can mean the difference between success and failure on a job. The paper touched on the importance of equipment which will dependably help to reduce the overall cost in sandblasting.

A Progress Report on the Use of Cathodic Protection in Conjunction with Paint Coatings. William L. Crosby, Consolidated Edison Co. of New York, New York, N. Y.

Attempts to mitigate corrosion of steel tanks housing hundreds of transformers and network protectors have led to two main investigations: first, the selection of the best available paint coating system from a corrosion protection standpoint that can readily be applied, and second, the determination of the feasibility of applying cathodic protection in conjunction with this coating. The selection of the best paint coating system has involved laboratory testing of approximately one hundred different systems under conditions simulating those encountered in service. As a result, the present coating system consists of three coats of an asphalt base paint. Recently two plastic coating systems, both vinyls, have shown up equally good on test but application difficulties have prevented their adoption at present. The study of the feasibility of applying cathodic protection in conjunction with the protective coating is still in its initial phases although it has been going on for over a year. To date, the investigation has considered the following phases: (a) Choice of a suitable electrode, magnesium vs. aluminum. (b) Effect of cathodic currents from magnesium electrodes on four different paint coatings.

(*Turn to page 21*)

AMINO RESINS

By C. D. Thurmond,
Monsanto Chemical Co.

IT is always interesting to review the history of a group of compounds in order to understand their present status. As we find in many instances, the first knowledge of this type of compound dates back over one hundred years to *Wohlers'* synthesis of urea. During this period of time *Holzer* and *Tollens* investigated the reaction of urea with formaldehyde in 1884. Then in the early twenties feverish activity resulted in many patents on urea-formaldehyde products. Even with this send off, it took another ten years before *Ripper* showed the world how to harness this product for surface coating applications by "Butylation of the methylol ureas."

Melamine, a member of the triazine family, is also on old-timer which has only comparatively recently been exploited. *Liebig* is credited with the first recorded preparation of chemical melamine in 1834. It remained a very rare chemical indeed, until the late thirties when a workable process suddenly dropped its price to very nearly its present levels. Some very fast work on its methylol compounds resulted in butylated melamine resins which appeared on the market in 1940. In less than 15 years then, production of urea and melamine coating resins has grown from nothing to many thousands of tons per year.

Chemistry

NOW that we have brought these compounds up to modern times it is interesting to look at their chemistry. For demonstration only, one possible method of reaction will be given with no attempt to delve into all possibilities. In the first case, let's examine urea. (See Fig. 1).

Actually, it is impossible to obtain a clear picture of what occurs when these units come in contact with each other. However, it is very likely an equilibrium is reached in the butylation reaction depending on the conditions.

Melamine which is the newest of the group can be prepared from Dicyandiamide, then reacted with Formaldehyde and "Butylated" as illustrated. (See Fig. 2).

You have noticed that the methylol compounds in each case have been "Butylated" before they are ready for surface coating work. The role the alcohol plays in the synthesis is very important. Normal butyl alcohol is the most commonly used, but this was learned through bitter experience. Four carbon-atom chain-length alcohols seem to be the maximum for direct etherification of methylol compounds and as would be expected, primary alcohols react more easily than secondary.

It is possible to use longer chain alcohols such as octyl and lauryl but it is not practical for direct etherification. The short chain methyl, ethyl and isopropyl etherify but the recovery is hampered by high water solubility. Long chain alcohols are useful to improve compatibility and are usually introduced by transetherification from lower alcohol ethers.

Resin Properties

SINCE the more basic concepts of these resins has been covered, it will be interesting to examine some of the properties controlling their final properties. These are summed up as in Table I.

By reviewing the variation in properties with the changes in formulation it is easy to realize any given resin results from a combination of properties predetermined to meet end results.

The actual mechanism of cure for the amino resins is somewhat obscure but it is worth while to demonstrate a possible method with both octyl alcohol and an alkyd resin. (See Fig. 4).

The two most important conditions are:

1. Slight acid condition (Acid Number 2–3 plus).
2. Sufficient hydroxyl groups to split out butanol.
3. Temperatures sufficient to promote reaction.

This paper was presented before the January meeting of the Golden Gate Paint & Varnish Production Club for publication in the Official Digest of the Federation of Paint and Varnish Production Clubs and is published here with their permission.

RESIN CHARACTERISTICS

FORMULATION CHANGES*	PROPERTIES VISCOSITY	CURE	COMPATIBILITY	SOLUTION STABILITY	MINERAL SPIRIT TOLERANCE
Formaldehyde (content)					
High	Low	Slow	Very Good	Excellent	Very Good
Low	High	Fast	Poor	Poor	Poor
Alcohol (type)					
Long Chain	Low-Med.	Slow	Very Good	Good	Very Good
Short Chain**	Low	V. Fast	Poor	Poor	Poor
Alcohol (content)					
Maximum	Low	Slow	Excellent	Good	Excellent
Minimum	High	Fast	Poor	Poor	Poor

* Only one variable at a time—PH controlled.
** Frequently leads to popping troubles.

Table I

A. Urea formaldehyde (normal catalyst) 225–250° F.

B. Melamine formaldehyde (normal catalyst) 200–500° F.

The transetherification with an alkyd resin is obviously in the most simplified form, while actually there will be many simultaneous reactions taking place at once.

Alkyd resins high in hydroxy content are very susceptible to this probable reaction with amino resins. This might be one of the reasons why short oil alkyds with excess alcohol over theoretical are more compatible yielding higher gloss and toughness than the corresponding types with little or no apparent excess. There is evidence to indicate good compatibility and cure can be obtained from long oil alkyds with free hydroxyl groups.

Since it has not yet been possible to attain all of the desirable properties of amino resins in a single product, there are several general types available. We are all familiar that the war brought about a change in the way alkyd resins are considered for formulation. Before this time it was necessary to remember all products by numbers. Since then, they have been grouped by the percent phthalic anhydride and type of oil. Then it is only necessary to review products in the proper groups.

In a similar manner the amino resins can be considered groupwise for formulation. If the requirements are for a flash bake, only that type resin need be considered. Taking the melamine resins first, we find four types:

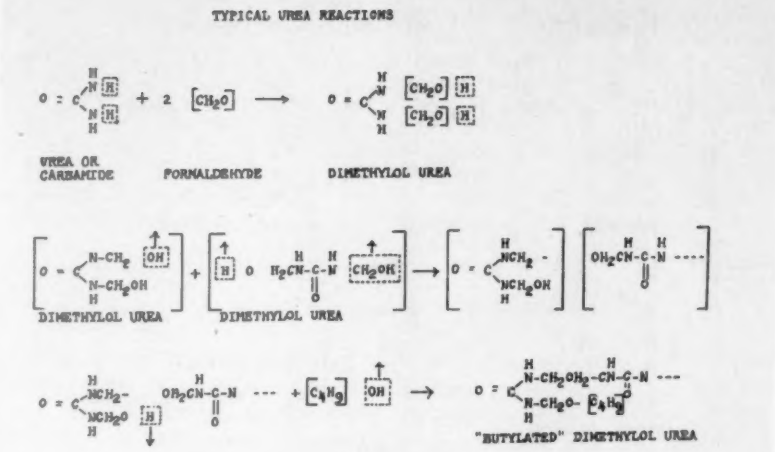


Figure 1

TYPE 1—Very fast curing, high color retention, limited compatibility, and aliphatic hydrocarbon tolerance, good alkali resistance. A—High Viscosity, B—Low Viscosity.

TYPE 2—Slower curing, excellent compatibility, particularly with mineral spirits soluble alkyds, very high mineral spirits tolerance, high gloss, fair alkali resistance.

TYPE 3—Good curing properties, excellent compatibility, very high gloss, best alkali resistance.

TYPE 4—Essentially the same as TYPE 3, but offers very wide latitude in active solvent selection.

ENAMEL STABILITY*

TYPE I RESIN (MELAMINE VISCOSITY	ALKYD RESIN VISCOSITY**	ENAMEL STABILITY	ENAMEL REDUCIBILITY
B—Low	Low	Best	Poor
B—Low	High	Good	Fair
A—High	Low	Good	Fair
A—High	High	Poor	Best

* Solvent combinations constant.
** Same oil content (approximate).

Table II

You will notice two viscosity variations in Type 1 which possibly would be considered two types. However, since in either case they are fast curing resins with similar mineral spirits tolerance it is more logical to divide them by viscosity in the same classification.

As a general statement to guide formulation work it can be said that enamel stability is affected by the alkyds used in making the blends (see Table II).

Table III indicates how the Resimenes fit into these general groups.

An examination of Resimenes 881 and 883 readily indicates they are the same base resin with different solvent combinations. However, they are modified so greatly by this change they become readily suited to entirely different uses. Resimene 883 is particularly well adapted to roller coating work with low formaldehyde odor and low solvent odor.

The urea resins fall into similar groups:

TYPE 1—High viscosity, fast cure, limited compatibility, general purpose use.

TYPE 2—Low viscosity, slower cure, much better compatibilty, better gloss.

TYPE 3—Very high mineral spirits tolerance and excellent com-

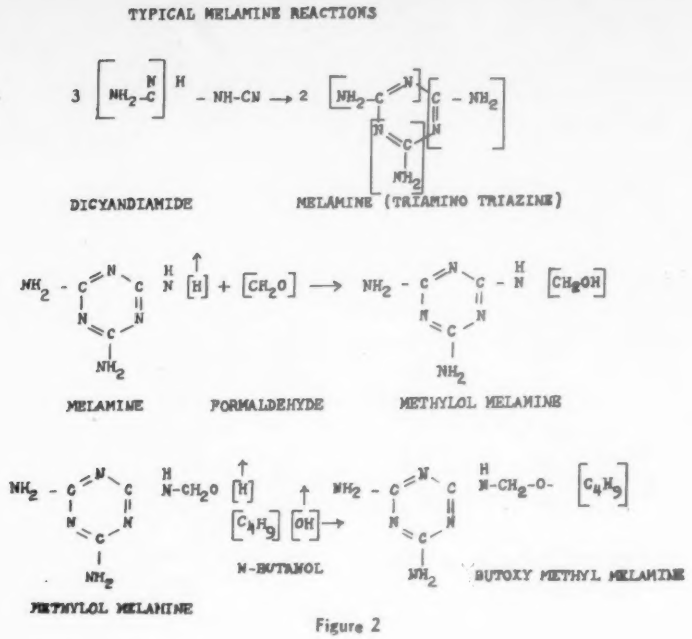


Figure 2

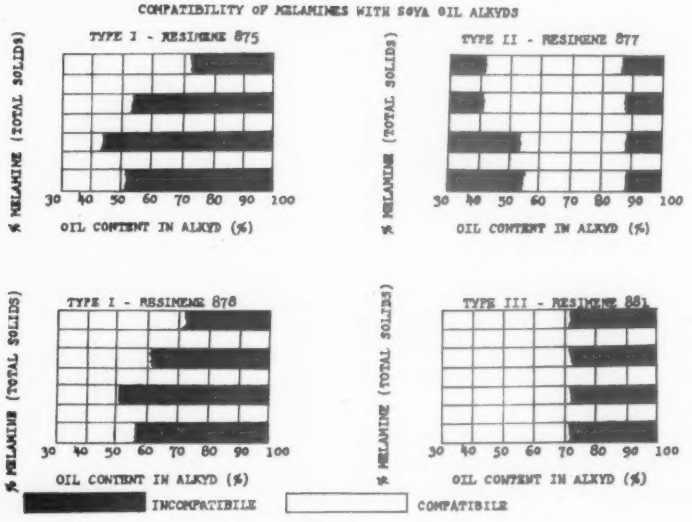

COMPATIBILITY OF MELAMINES WITH SOYA OIL ALKYDS
TYPE I - RESIMENE 875
TYPE II - RESIMENE 877
TYPE I - RESIMENE 878
TYPE III - RESIMENE 881
% MELAMINE (TOTAL SOLIDS)
OIL CONTENT IN ALKYD (%)
30 40 50 60 70 80 90 100
INCOMPATIBILE
COMPATIBILE

Figure 3

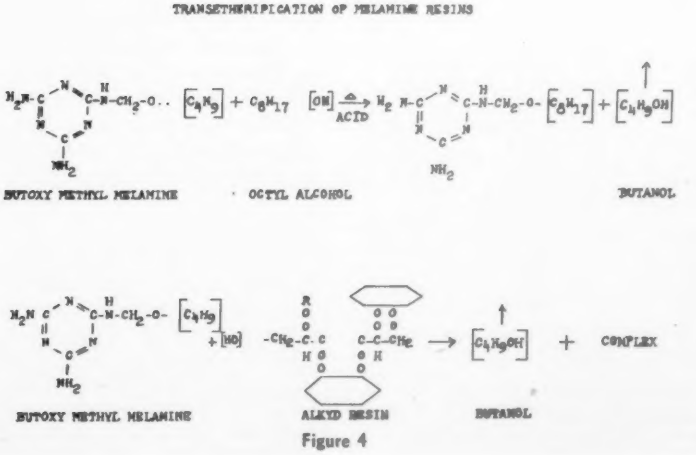


Figure 4

patibility, very low viscosity, rather slow cure and high gloss.

TYPE 4 — Essentially same as TYPE 3, but permits wide latitude in solvent selection.

It was noted earlier that there is considerable more background in urea resins than melamine; however Monsanto has just entered this field with Resimene U-901 as a general purpose type in Class I as noted in Table IV. There are other types available with the properties given.

In the use of amino resins it is important to select the correct resin for a given set of conditions, considering the economic effects. Following is a general comparison of melamine and urea resins.

Melamine—(1) very much faster cure, especially Type 1; (2) much better alkali resistance; (3) much better color retention and gloss retention on over baking; (4) less film shrinkage on curing resulting in better build per coat; (5) better initial gloss and flow; (6) much wider baking range (200–500° F. vs. 225–350° F.); (7) much better cure in low amino ratio (5–15%); (8) better exterior durability, gloss retention, chalk resistance, and checking resistance.

Urea—(1) lower cost on pound per pound basis; (2) can be used with acid catalyst at low temperatures (125–160° F.); (3) easier patching on rejects, probably because of poorer solvent resistance; (4) Type 1 yields higher viscosity enamel at equal solids content; (5) holds pattern better in hammertone finishes, especially Type 1; (6) better adhesion on pound per pound basis.

The stability of an enamel can be controlled to a very great extent by selecting a solvent combination rich enough in "true" solvent. In the same manner a solvent combination too low in "true solvency" will produce unstable enamels regardless of the type resins under consideration. The incentive to use the minimum of "true" solvent of course, is to obtain maximum thin down.

There are three types of Amino resin solvents: "True," "Latent" and "Diluents."

True or Actual solvents are materials in which the resin can be completely dissolved and reduced to 1–2% solids without precipitation. Example—Butanol.

MELAMINE RESINS

	RESIMENE					
	875	878	877	881	882	883
Type	1 (A)	1 (B)	2	3	4	4
Solids, %	50	50	50	60	65	60
Butanol, %	25	35	25	20	—	VM & P 20
Xylol, %	25	But. cell 15	M.S. 25	20	35	But. cell 20
Acid no.	—1	—1	—1	—1	—1	—1
Viscosity	L—P	I—M	I—M	L—P	Z—Z4	S—W
M.S. tol.*	2.5–3.5	3.0–5.0	INF	1.62–2.8	0.4–2.0	1.0–2.0

* Measured with a naphtha having a kauri-butanol value of 31–34. The figure represents cc's of naphtha per gram of solution.

Table III

TYPE OF FINISH	MELAMINE	UREA
Automobile body	Type 3, 2	....
Refrigerator	Type 3	Type 2
Washing Machine	Type 3	Type 1
Metal Decorating	Type 4	Type 3
Heating Appliance	Type 1	....
Dipping Enamel	Type 2	....
Clear Metal	Type 1	Type 2
Furniture, wood	....	Type 2*
Metal Primer, baking	Type 2	Type 1
All purpose, baking	Type 1, 3	Type 1, 2
Auto lacquer	Type 3, 1	....
Hammer finish, baking	....	Type 1

* Acid catalyzed

Latent or Pseudo solvents are materials which when used as a reducer for True-solvent solution lowers the viscosity markedly but has no True solvent properties. Example—Xylol.

Diluents are materials which lower the viscosity of True-solvent solution but have a limited tolerance. Example—Mineral Spirits.

Applications

As a starting point, let's look at some graphic data (Fig. 3) on the compatibility of the representative types of Resimene.

Within the limits in which they are compatible, melamine resins will improve the hardness, soap, water and solvent resistance, initial color, color retention, and exterior durability of the alkyd resins in present-day usage in baking finishes. Perhaps one of the earliest applications for melamine resins was the use of 5 to 10% to control wrinkling of alkyds used in automobile finishes. Further work with these products led to the now well-known properties of extreme hardness, high initial color, protection of this color on over-baking and on exterior exposure and adaptability for infra-red baking schedules.

Prior to the introduction of urea and melamine resins, large volume industrial finishes were divided into two general groups, *i.e.*, those containing "oleoresinous" vehicles and those containing "synthetic" vehicles. The synthetics employed alkyd vehicles in contrast to the varnishes used in the oleo-resinous type. The introduction of urea and melamine resins was very timely, since they tend to complement the alkyds and to show their best properties in such combinations. It is conceivable that, had the amino resins been exploited *before* the alkyds were pretty well-known vehicles, their good properties might have been over-looked. The combination provides an efficient, relatively low-cost, reactive plasticizer for the amino resins, or a means of providing rapid heat conversion for the alkyds. The choice of urea versus melamine for a given application is governed therefore by the relative effect upon the film properties desired.

The following shows the choice of amino resins for a given finish for given sets of properties.

PROPERTY	MELAMINE	UREA
Exterior Durability	2, 3, 1	3, 2, 1
Gloss	3, 2, 1	3, 2, 1
Flexibility, Adhesion	3, 2, 1	3, 2, 1
Soap Resist.	3, 1, 2	1, 2, 3
Flow	2, 3, 1	3, 2, 1
Color Reten. (heat)	1, 3, 2	1, 2, 3
Gloss Reten. (heat)	3, 2, 1	3, 2, 1
Cure Speed	1, 3, 2	1, 2, 3
Chem. Resist.	3, 1, 2	1, 2, 3
Humidity Resist.	3, 1, 2	1, 2, 3

It is to be realized that the above represents generalities, but should, nevertheless, give a picture of the properties each type confers and in what type of finish each finds its greatest utility. Proportions used will, of course, vary the over-all film properties, as will choice of alkyd. The alkyd choice will depend on type of oil and oil content for any given application, of course, but the amino resin choice can be made from the above data with reasonable assurance that it will confer upon the combination the desired properties and generally in proportion to the amount used.

Acknowledgments

The author wishes to acknowledge the helpful suggestions made by *F. J. Hahn* and *R. B. Green* of Monsanto Plastics Division, application laboratory, and *C. H. Parker* in charge of Technical Service on surface coating resins.

UREA RESINS

	RESIMENE U-901	RESIN B2	RESIN C3	RESIN D4	RESIN E5
Type	1	2	2	3	4
Solids, %	50	50	55	60	60
Butanol,%	30	30	30	24	—
Xylol, %	20	20	15	16	—
Other, %	—	—	—	—	40 (H.F. naphtha)
Acid no. solids	2–3	10.0 max.	2–4	3–8	3–8
Viscosity	W—Y	N—P	S—U	L—Q	W—Z
M.S. tol.*	1.0–1.7	3.0	3.0	8.0	2.5

* The figures represent average values and are expressed in cc's of 38 kauri-butanol value mineral spirits per gram of resin solution.

Table IV

EVALUATION OF PROTECTIVE COATINGS

By GEORGE S. COOK,
Engineer Research and Development Laboratories, Fort Belvoir, Va.

properties of PACKAGED PAINT

PART 1

IN the examination of paint, the layman is usually restricted to the measurement of only a few properties of the coating. For him, the color, coverage, consistency, and condition in the container are the important considerations. The commercial user, however, considers such an examination primarily as a starting point and as an aid in understanding the more complex properties and requirements of the coating.

The layman is further handicapped by the lack of measuring tools and standards for rating his examination. The commercial concern, however, usually has definite methods of examination and specified standards for the property. It is the purpose of this article to describe the methods that are used for the examination of the packaged paint.

Package stability characteristics determine the condition of the paint in the container. Adequate package stability requires little or no settling or separation of the various components, no gelling, livering, or thickening of the coating, and no skinning.

Factors Affecting Stability

Shelf Age of the Coating. Since the degree of settling and separation is directly proportional to the length of storage time of the packaged coating, proper formulation must allow for extended storage life.

Storage Conditions. Inappropriate storage, such as excessive heat or frequent cycles of freezing and thawing, may cause a complete separation of the vehicle solids from the vehicle which cannot be restored by mixing. Temperature variation during storage is of increasing importance as the compatability of the ingredients decrease and as the solvency of the thinners decrease. High mental in forming metal soaps with temperatures of storage is instruconsequent granulation.

Reactivity of Components. Pigments which react with the vehicle may cause progressive thickening of the coating. When using reactive pigments, a vehicle with a low acid number is to be preferred. Progressive wetting of the pigment by the vehicle during storage may reduce the consistency and increase settling tendencies.

Factors Controlling Stability

Consistency. For a given paint, settling is inversely proportional to consistency. Bodying agents which promote flocculation of the pigment not only reduce settling but also aid in the formation of a soft cake when settling does occur.

Choice of Materials. The use of adequately compatabile materials will reduce separation on prolonged standing. The use of pigments of higher bulking values will reduce settling. Skinning can be reduced and eliminated with the use of anti-skinning agents such as, pyrocatechol, guaiacol, salicylic acid, and others.

Measuring Package Stability

Condition in Container. (Method 301.1 Federal Specification TT-P-141b). Open the original package as received and examine for skinning before shaking or stirring. Remove, by means of a spatula, any continuous skin that may be present, stir the contents of the package with a stiff spatula or paddle and examine for caking or difficulty in breaking up the material. Immediately after thorough stirring, examine the surface of the material for floating pigments.

Storage Stability. (Filled Container, Method 414.2 Federal Specification TT-P-141b). An 8-ounce, wide-mouth glass jar, 4½ inches in height and 2 inches in diameter, shall be used as the container. The jar is filled with the paint, and at the end of the specified storage time the paint is examined for skinning, settling, thickening, curdling, gelling, etc. as specified.

Skinning. (Partially Filled Container, Method 414.1 Federal Specification TT-P-141b). An 8-ounce, wide-mouth glass jar, 4½ inches in height and 2 inches in diameter, shall be used as the container. A 6-ounce sample of the paint shall be

The methods developed and used by the paint industry for the examination of organic coatings have been extensively studied for the purpose of preparing a manual on the testing and evaluataion of paints. The results of this study are being presented, herewith, as a series of articles in the belief that it will be of aid and benefit to the industry.

Methods in use by the American Society of Testing Materials, the Federal Government, and developed by the Federation of Paint and Varnish Production Clubs will be given precedence over the other available procedures. Where no standard method exists, a number of the more appropriate tests will be discussed with preference being given to those requiring the least expense in time and equipment.

Most of the published methods do not furnish the investigator with a description of the important considerations involved in the property being measured and thereby hamper the investigator in the interpretation of the results. It is intended, therefore, to include a summary of the significance of the property being measured, the factors which affect it, how the property may be controlled and what are the customary requirements.

The general topics for this series will be as follows: Properties of Packaged Paint; Physical Composition of Paint; Preparation of Test Panels; Application of Paint on Test Panels; Physical Properties of Paint Films; Performance Properties of Paint Films; Durability Properties of Paint Films; Evaluation Programs for Paints; Interpretation and Limitation of Results; and Statistical Methods of Analysis.

The reader is urged to submit his comments and suggestions.

The writer is indebted to Mr. Carlton Rose for his encouragement in this undertaking and to Messrs. Alvin C. Goetz, George Diehlman and Charles Green for their critical review and suggestions.

measured into the glass jar container by means of a graduate. The cover shall be secured on tightly and the jar inverted momentarily. The jar shall then be placed in an upright position in the dark (placing it under a box or in a drawer is satisfactory). The sample shall not be agitated or disturbed until inspected. The paint shall be examined for skinning after the specified time interval.

Heat Stability. A half pint can, ¾-filled with the paint as supplied, tightly covered, shall be put into an oven maintained at the specified temperature for the specified period. At the completion of the exposure the paint will be examined for skinning, settling, thickening, and gelling. The paint will be applied to panels and compared to the original paint in application properties and color.

Temperature Cycle Stability. Half-pint cans, ¾-filled with the paint as supplied, tightly covered, shall be brought to the specified temperature in a cold bath and maintained under these conditions for a period of one hour, exposed to room temperature for two hours, and finally placed in an oven and brought to the specified temperature, and maintained at this temperature for a period of two hours. This cycle will be repeated daily for the specified number of cycles after which the paint will be examined for settling, separation, gelling, thickening, and skinning. The paint will be applied to panels and compared to the original paint in application properties and color.

Reducibility and Dilution Stability. (Method 439.1 Federal Specification TT-P-141b). The material shall be diluted with the specified amount of the required diluent or according to the manufacturer's instructions, whichever applies. All materials shall be at ordinary room temperature (21° to 32° C. or 70 to 90° F.) unless otherwise specified. Observe whether the material mixes readily and easily with the diluent and whether it shows curdling, precipitation, or separation when allowed to stand 4 hours or other specified time in a well-stoppered glass container. If necessary, flow the mixture out on a glass panel for inspection.

Appearance of Pigmented Materials. (Method 450.1) Federal Specification TT-P-141b) Place a small quantity of the material on a glass plate. Examine for lack of smoothness under a strong reflected light while slowly working with a flexible spatula.

Rating Package Stability

Troutman (1) suggests a numerical method of rating settling and separation.

Degree of Caking. "Degree of caking" has reference to the extent of hard caking. Grading is done with a regulation 6-inch tapered spatula and is applied particularly to the pigment cake in a quarter pint can.

C 10+ Perfect dispersion—no sedimentation whatever apparent.

C 10 Gives practically no resistance to spatula. No deposit brought up with spatula—however, pigment may be rather well settled out.

C 9 Well-defined but very soft cake offering a slight but definite resistance to sideways motion of spatula (flat side of spatula foremost).

C 8 Spatula readily drops through to bottom of can under its own weight. Cake has toughened slightly so that portions can be removed with spatula.

C 7 Just possible to move spatula through cake sideways. Slight but definite edgewise resistance to spatula. This is the important point of initial failure by caking, i.e., where caking begins to become truly objectionable.

C 7– Practically impossible to move spatula sideways through cake.

C 6 Well-defined resistance to spatula when moved edgewise with one hand.

C 5 Just posible to move spatula edgewise with one hand.

C 4 Necessary to use both hands to produce edgewise motion of spatula.

C 3 Barely possible to move spatula edgewise through cake.

C 2 Impossible to move spatula edgewise when once inserted in cake.

Type of Sediment. "Type of sediment" has reference more particularly to the nature of the cake and describes its condition in a manner supplimentary to the following mentioned grading. Admittedly divisions in grading are somewhat arbitrary.

T 10 Mushy and very loose cake.

T 8 Soft and gummy.

T 6 Noticeably tough and gummy.

T 4 Dry and tough cake.

T 2 Dry and brittle cake.

Dispersion in Supernatant Vehicle. "Type of dispersion" describes the condition of the supernatant vehicle with regard to the amount of pigment still dispersed.

D 10+ Perfectly dispersed.

D 7 Very cloudy.

D 5 Cloudy below but clear on top.

D 2 Completely settled out, leaving a clear vehicle free from dispersed pigment.

Depth or Height of Cake. In addition, the depth of cake may be indicated in percentage. This can be conveniently measured with a spat-

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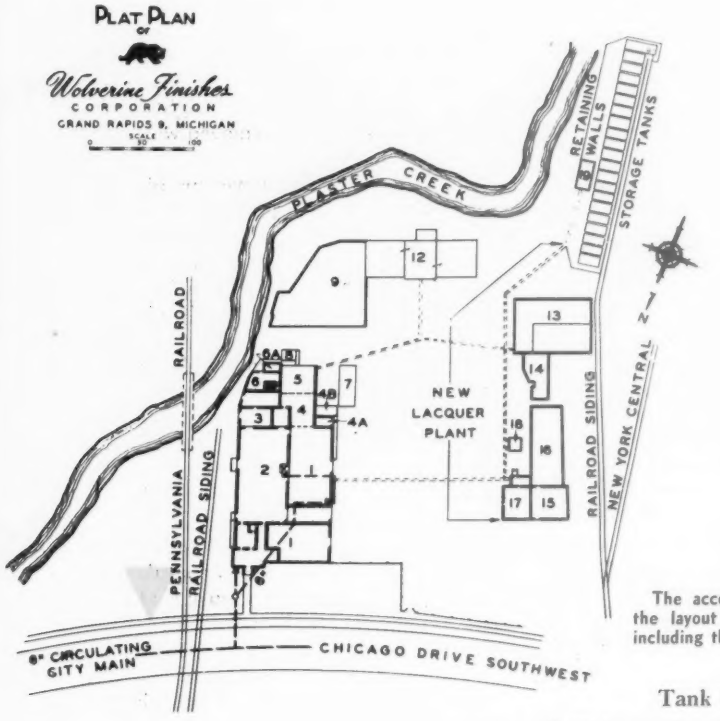
BUILDING NUMBER	OCCUPANCY	BUILDING NUMBER	OCCUPANCY
1	OFFICE, STAIN & ENAMEL ROOMS, SHOW & FINISHING ROOMS & STORAGE	8	STILL HOUSE
		9	DRUM CLEANING & WAREHOUSE
		12	BOILER ROOM, WORK SHOP & LABORATORY FUEL OIL STORAGE
2	SHIPPING & STORAGE	13	STORAGE
3	STORAGE & FILLER MIXING & SAMPLE STORAGE	14	LOCKER ROOM, TOILET & CONTROL ROOM
4	GRINDING ROOM	15	LACQUER CUTTING
4A	ELECTRIC ROOM	16	LACQUER CUTTING
4B	PIGMENT STORAGE	17	CLARIFYING & FILTER ROOM
5	GRINDING ROOM & LABORATORY	18	SWITCH HOUSE
6	STORAGE & GRINDING	19	PUMP HOUSE
6A	FUEL OIL TANK HOUSING		
7	STORAGE		

Builds a New LACQUER PLANT

By E. M. Dumbar,
President of Wolverine Finishes Corp.



The accompanying plan shows the layout of the entire plant, including the new facilities.

WOLVERINE Finishes Corporation of Grand Rapids, Michigan, has recently put into operation a new lacquer plant which includes a number of outstanding safety and production features.

Plans for the new lacquer plant were first considered several years ago. Protection of plant personnel and property adjacent to the plant; assurance of a dependable source of supply of quality products; and production efficiency were the more important factors considered in designing the plant.

The design has incorporated into it a number of outstanding safety features which should minimize the possibilities of fire or other accident, thereby protecting the people employed in the plant, the Public, and also assuring customers that interruption of production is a remote possibility.

Tank Farm

AT the south end of the plant, the tank farm has been relocated, the entire battery being enclosed by a concrete dike to prevent the escape of solvent in case of a spill from any cause. The fill connection of each tank is through the top, with a fill pipe extending to within a few inches of the bottom of the vessel. The purpose of this is to prevent the formation of static electricity, which could form if the liquid is allowed to fall through the space within a vessel. Each tank is grounded to a low resistance ground to dissipate static or stray electrical currents.

The vent of each tank is fitted with an approved flash arrestor, and the vent size is such as to provide relief even though a tank or the entire battery should be completely enveloped in flame.

Tank cars of solvents or diluents are received on the plant siding, and these are top unloaded by means of a positive type pump. Facilities are also available for the receipt of solvents and diluents and other liquids by tank truck, and these too can be delivered to the various storage tanks.

Pumps located in a building of fire resisting construction take suction from the tanks and deliver solvent and diluent to the various points in the lacquer-manufacturing building, and also to the thinner filling station, located in the Enamel Manufacturing Building.

Solvent Handling

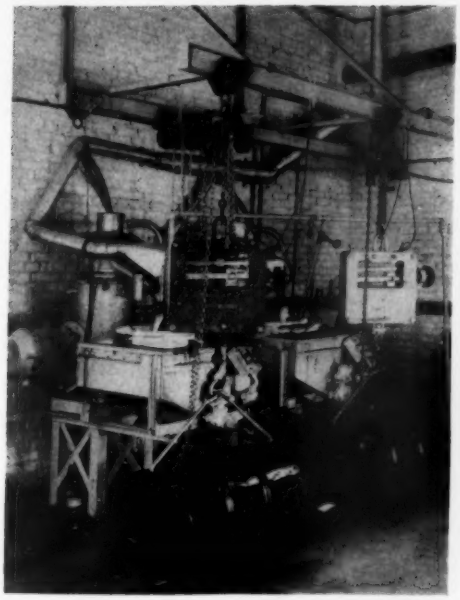
THE solvent handling facilities are outstanding and unique, and probably represent a new development of major importance.

By means of a panelboard in the control room, the operator, by setting the controls is able to deliver to any one of the various mixing vessels, the required gallonage of solvent or diluent. This is done by means of electrically operated valves of a new type, located in the pump house. Solvent from the various tanks is always up to each of the electrically operated valves.

By setting of the controls on the board, an operator is able to deliver without manual operation, the sol-

FINISHES CORPORATION

Wolverine Finishes' new lacquer plant is building on extreme right.



View shows clarification and packaging arrangement.

vent required with little possibility of error as the circuits are interlocked and it is not possible to deliver fluid to a mixer or other location for which it is not intended.

After the solvent and diluent required is delivered through a meter to the indicated dissolver, the valve automatically closes and the pump stops, and the line is blown clear automatically after the operator presses the button calling for that operation.

Because of the unique features of these valves, a further description should be of interest. They are the globe type with an extended stem, which is powered by means of hydraulic oil pressure, the pressure being applied to the oil by means of a motor-driven gear pump—an integral part of each valve.

When the motor is energized, pressure is applied to the oil cylinder, resulting in the valve opening; and when opened, is held in that position by a magnetized piston. When current is cut off intentionally or otherwise, the motor is, of course, deenergized, and the valve closes.

All parts of the valve and other electrical equipment in the zones where solvents are handled are explosion-proof or conform closely with the standards for explosion-proof equipment.

Raw Material Storage

LOCATED about 50 feet north of the solvent tank farm is the raw material storage building. This structure is a two-compartment building of masonry construction, arranged for direct unloading of materials from broad gauge cars, and thence transfers as needed into the manufacturing building. Truck deliveries can also be received at this building. One compartment of this building is cut off from the other by blank masonry walls, and entrance to and exit from it is by means of separate doors. This compartment is reserved exclusively for the storage of barrels of nitrocellulose.

In the other compartment, pigments, resins, plasticizers, and other ingredients are stored; those containers which are stored on racks, being placed on or removed from them by an air hoist.

The floor in each of these compartments is a concrete slab covered

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Lacquer mixers. Note pumping arrangement at bottom.

Entrances to lacquer mixing rooms, fire walls separate eac

. . . WOLVERINE PLANT
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with a nonsparking and conductive finish.

The wall facing the tank farm on the south is a blank one, so as to provide a fire barrier in case of a fire either at the tank farm or the storage building.

A 50 foot space separates the raw material storage from the south end of the manufacturing building. The end wall of that building is solid, and the door opening in this wall, as well as the openings in the warehouse building, are protected by means of fire doors.

The various ingredients required, other than solvents and diluents, are transported by means of hand trucks over an elevated walkway of fire resistant construction, connecting the storage building with the lacquer-manufacturing building proper—this walkway being at the same level as the upper floor of the lacquer-manufacturing building. The walkway is roofed and partly housed in, so that weather conditions do not interfere with the efficient movement of raw material packages into the manufacturing building.

Manufacturing Facilities

THERE are six individual mixing rooms in the lacquer-manufacturing building, and turbine type mixers are presently installed in four of these six rooms. Mixers are to be installed in each of the other two rooms when production requires it. Each room is cut off from the adjoining one by means of a winged and parapeted firewall; so that if a fire should occur in one room, it should be confined to that location. The construction of these rooms and the remainder of the building is fire resistant, so the probability of fire damage to the structure has been reduced to a minimum.

In addition to the above equipment, three other large mixers and a large solution dissolver are located in the large lacquer-manufacturing room.

The charging nozzles of the mixers in the various rooms, and also those just mentioned above, are flush with the floor, which makes for quick and efficient charging.

In addition, the length of the charging connection, made of a nonsparking metal, is quite short, so that the tendency for materials to accumulate at this point is decreased. As an added protection against sparking at this point, the charging nozzle and its cover are made of nonsparking metal; and each cover is counterweighted and equipped with a fusible link, so that in case of fire, the covers should automatically close.

A positive type pump, driven by an explosion-proof motor is installed below each mixer. The lacquer flows by gravity to each of the pumps; and there is a strainer in each suction line. The lacquer is delivered by these pumps to clarification equipment located in the drum filling room, where drums and other containers are filled to prescribed weights.

The conditioning of drums and containers is carried out in Building 9, a structure of fire resisting construction, built to house this work. The conditioned containers are delivered to the drum filling room and the Enamel Manufacturing Building by motor truck.

Also included in the expansion program was the erection and equipping of the New Laboratory Building, in which research and control work is carried out by a staff of technical men, headed up by Mr. William Oberg.

In addition to the fire resisting construction, each of these rooms and the other portions of the new lacquer plant have been explosion vented, using a ratio of about 1 square foot to each 25 cubic feet of room volume; so that in the event of a vapor-air explosion, pressure should be quickly relieved and without causing serious structural damage.

A nonsparking conductive floor finish has been used throughout all of these rooms as well as the large room at the north end of the plant and the packaging room adjoining that. Also, all electrical equipment throughout the new building is explosion-proof, Class I, Group D. In order to avoid the expense of Class I, Group D, control equipment, conventional equipment has been installed in the switch house of fire resisting construction, which is reasonably well removed from the lacquer-manufacturing building. Should there be a solvent spill originating at the lacquer plant, the probabilities of vapors rising to or reaching the control equipment is remote.

Another unique feature of this plant is the means adopted for heating. Conventional methods were rejected, and radiant heat installed. This consists of copper pipe buried in the concrete floor slab, hot water being circulated through these coils at about 110° F. The heat is even and uniform, and there is a complete absence of exposed steam piping, radiators, unit heaters, etc. The elimination of these items makes for cleanliness, ease in housekeeping, and an absence of hot metal, which could be the cause of trouble with heat sensitive materials.

The nitrocellulose storage building is to be protected by a deluge sprinkler system with a head spacing of 50 square feet or less per head, and pipe size to conform.

The various rooms housing the mixing equipment and the other rooms of the new lacquer plant are protected by a CO_2 flooding system, which can be operated either automatically or manually. In addition to this fire protection, an adequate number of first-aid hand extinguishers are avilable at strategic locations about the plant, and the plant staff has been trained in the use of all of these facilities.

A number of photographs show views of the plant buildings and some of the equipment installed. These pictures, together with the layout and this description, serve to convey a good idea of the substantial construction and the emphasis placed on efficiency, safety, and fire protection. With the design adopted, the care exercised in operation, the standard of cleanliness and good housekeeping which is being maintained, the probability of there being a serious accident has been reduced to a very great extent.

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Advance Solvents Names Lechner Midwest Sales Representative

Advance Solvents & Chemical Corp. of New York has designated Carl A. Lechner manager of sales for the middle west territory in addition to his duties as manager of the company's Chicago office.

. . . PACKAGED PAINT

(From page 15)

ula having a suitable scale marked on the blade. The ratio of the depth of cake to the depth of the paint can thus be conveniently estimated and recorded. Such measurements may be indicated by "H" followed by the numerical value.

Requirement for Stability

Condition in Container. The paint shall show little or no settling or separation in a freshly opened container and shall mix readily to a smooth homogeneous state after an aging period in the package of six months. There shall be no change in consistency that will appreciably affect working properties nor shall there be an appreciable loss in drying potential after an aging period in the package of six months.

Storage Stability. The usual storage test in a container other than the original is for a period of 30 days after which time there will be no change that will make it unuseable.

Skinning. The usual skinning test with a partially filled container ranges from a minimum of 48 hours to a maximum of 96 hours with the requirement that there will be no skinning. With longer periods of exposure, complete removal of the skin as one continuous piece after cutting completely around the side of the package with a spatula is required.

Heat Stability. Most heat stability tests are for a 96 hour period at a temperature of 120° F. to 160° F. with the requirement being the same as the 30 day storage test at room temperature.

Temperature Stability. Temperature stability tests are primarily used on emulsion paints with the lower temperature of exposure in the test ranging from 0° F. to – 40° F. and the oven temperature ranging from 120° F. to 160° F. with two or three complete cycles being used.

Reducibility and Dilution Stability. There is no usual requirement for this test since the type and amount of solvent is specific for the paint.

Appearance of Pigmented Materials. The usual requirement is that the paint shall be uniform, homogeneous and free from bubbles. There shall be no trace of grit or rough particles.

Reference

(1) J. J. Mattiello, *Protective and Decorative Coatings*, Vol. III p. 355–357. Reprinted with permission of the publisher John Wiley and Sons, Inc. New York, N. Y.

. . . CORROSION

(From page 8)

(c) Effect of electrolytes containing various mixtures of salt and fresh waters. (d) Effect of magnitude of cathodic current. (e) Actual field installation of a magnesium electrode in a tidal transformer manhole. It was quickly found that aluminum was not suitable as an electrode material since, after one day of test, it became slightly anodic to the test panels and offered no further protection. The tests on four different protective coatings, using a magnesium electrode and a straight sea (East River) water electrolyte with no control of the cathodic current, gave widely divergent results. Tests made on the standard asphalt base coating with electroytes consisting of all East River water, equal parts of East River and tap waters, and one part of East River water to three parts of tap water showed no major differences although the resultant cathodic currents were roughly proportional to the amount of East River water in the electrolyte. Tests made on the standard coating with cathodic currents maintained at 1.0 and 0.5 milliampere for comparison with the original test at 47–67 milliamperes indicate that deterioration of the coating around the window starts within 4 days and that the rate of deterioration is roughly proportional to the cathodic current in the ranges considered. However, at both lower currents, rusting was observed on the uncoated sections whereas none was observed at the highest current. The rapid and almost complete removal of the protective coating was confirmed by a trial installation of a magnesium electrode in a tidal transformer manhole in the Coney Island section of Brooklyn. Although indications to date are that cathodic currents of sufficient magnitude to prevent corrosion at breaks in protective coating surfaces cause deterioration of the coating, it is planned to investigate other electrode materials, and the effect of holding the galvanic potential below the hydrogen over-voltage point.

Lock and Dam Inspection

On April 3, 1950 thirty-three governmental and industrial paint and corrosion engineers undertook an inspection of test paints on locks and dams number 25 and 26 on the Mississippi River. This inspection was under the joint leadership of Mr. *Ken Tator*, Chairman of the Protective Coating Committee for the Association of Corrosion Engineers and Mr. *Sol Glazier* of the St. Louis District Engineer Office. Mr. *Alvin C. Goetz* of the Eagle-Picher Co. served as technical historian on the paint systems examined.

The group embarked by charter bus to Winfield, Mo. to inspect roller gates number 10 and 11 on Dam #25. These gates contained 56 test sections for the various systems and methods of preparation of the surface undergoing examination. The gate had been sandblasted and painted in the fall of 1938 and was placed in service in the spring of 1939. At the time of this inspection, the gate had been in service for 11 years. The group examined and rated each system in regards to rusting, blistering, amount of top coat present and the amount of primer present. These individual ratings were then averaged out with six points for rusting, one point for blistering, one point for top coat and two points for primer; to give an overall protection rating for the paint system. A system rated as ten would be giving perfect protection. The actual ratings varied from about 2 to over 7 for the various systems which is remarkable when the number of years of exposure is considered.

These roller gates are used to regulate the height of the Mississippi River and serve both in navigation and flood control. The paints are subjected to almost continuous water immersion and undergo a severe abrasion action from the mud and silt contained in the water. The abrasion and scraping action by floating logs is also a severe exposure condition for the water line area of the paints.

After lunch the group traveled to Alton, Illinois to inspect tainter gates 21 and 28 of lock and dam no. 26. These two gates were divided into 13 test sections with gate #21 being placed in service in Nov. 1946 and gate #30 in the fall of 1941. The condition of each section was again rated by the group. The ratings were collected by Mr. Glazier for consolidation and study by his office and will be used in their evaluation of the relative merits of the different paint systems under test.

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UCC Transfers Drexler to Boston

John H. Drexler has been transferred to the Boston office of Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation as a technical representative. He was formerly with the Philadelphia district office. Mr. Drexler has been with Carbide since 1940 except for service as a naval aviator in World War II. He is a graduate of Rutgers University.

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424 Bowen Building,
Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Rosin Products

U. S. Patent 2,497,882. Burt L. Hampton, Jacksonville, Fla., assignor by mesne assignments to the Glidden Co., Cleveland, Ohio, a corporation of Ohio.

The process of producing an improved rosin composition characterized by imparting an increased resistance to yellowing in soaps and sizes made therefrom, which process consists of heating a rosin material under non-oxidizing conditions with from 0.5% to 5% in sulfur equivalent of at least one catalytic material selected from the group consisting of sulfur, sulfur halides, alkali metal sulfides and alkali metal polysulfides, in the presence of a small percentage up to about 38% of the stoichiometric quantity of an alkali metal alkali required to neutralize the rosin material at a temperature between about 200° C. and 375° C. for a time sufficient to decrease the degree of unsaturation without aromatization of substantially more than one ring of the rosin material.

Melamine Condensate

U. S. Patent 2,499,373. Colver P. Dyer, Winchester, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo., a corporation of Delaware.

A method of manufacturing melamine comprising mixing dicyandiamide and ammonia and heating the mixture under positive pressure in the presence of from about 0.2% to about 2.0%, based on the weight of the dicyandiamide, of a neutral ammonium salt of an inorganic acid.

Colored Polyethylenes

U. S. Patent 2,500,023. Robert E. Burk, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

In a process of polymerizing a liquid, polymerizable, monomeric ethylenic compound having a negative substituent on one of the ethylenic carbons and having only isolated carbon to carbon aliphatic unsaturation and that ethylenic, to form a colored polymer, the step which comprises adding to said monomeric ethylenic compound organic coloring matter fadable by the presence of benzoyl peroxide during polymerization, and a colorless non-aromatic azo compound having both valences of the azo group attached to different tertiary carbons further bonded to a group of the class consisting of the nitrile, carbalkoxy, and carbonamido groups, and thereafter carrying out the polymerization of said monomeric ethylenic compound in the absence of a peroxide polymerization catalyst.

Polymerizing HCN

U. S. Patent 2,499,441. David W. Woodward, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

A method for polymerizing hydrogen cyanide to its tetramer, which comprises continuously passing liquid hydrogen cyanide at a temperature of 0° to 100° C. into contact with a basic reacting solid catalyst which is insoluble in liquid hydrogen cyanide and which has a residual alkalinity such that in being neutralized to a pH of 7 it absorbs an amount of acid equivalent to between 0.1 and 10 milliequivalents of sodium hydroxide per gram of catalyst, continuously removing the reaction mixture as formed from contact with said catalyst, and separating hydrogen cyanide tetramer as the reaction product from said reaction mixture.

Insoluble Cellulose Esters

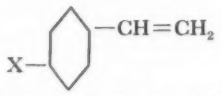
U. S. Patent 2,500,029. Hugh J. Hagemeyer, Jr., Kingsport, Tenn., assignor to Eastman Kodak Co., Rochester, New York, a corporation of New Jersey.

A process for forming ester filaments insoluble in acetone which comprises reacting diketene with cellulose acetate having 0.1–1.5 hydroxyl groups per C_6 unit of cellulose, dissolving the cellulose acetate-acetoacetate thus formed, spinning the solution and treating the filaments thus formed with an aqueous solution of formaldehyde of 3–10% strength in the presence of pyridine.

Styrene-Fumaric Ester Polymers

U. S. Patent 2,498,099. Pliny O. Tawney and Jerome G. Kuderna, Jr., Passaic, N. J., assignors to United States Rubber Co., New York, N. Y., a corporation of New Jersey.

A soluble unsaturated interpolymerizate of a vinyl-aromatic compound of the formula



where X is a radical selected from the group consisting of hydrogen, methyl, and chlorine, a compound selected from the group consisting of dialyl fumarate, dimethallyl fumarate, and di-(2-chloroallyl) fumarate, and a chlorinated alkene having from 3 to 4 carbon atoms, prepared from a mix having by weight, based on the fumarate, from 1–500% of the vinyl-aromatic monomer and 10–500% of the said alkene.

Paper Coating

U. S. Patent 2,498,207. Herman C. N. Heckel, Oxford, Ohio, assignor to the Champion Paper & Fibre Co., Hamilton, Ohio, a corporation of Ohio.

Coated paper having substantially the same printing qualities as casein coated paper which comprises paper base carrying a coating adherent thereto and deposited from an aqueous composition comprising mineral pigment 100 parts dry weight, and from 8 to 30 parts of an adhesive comprising oxidized cellulose dissolved in alkali, said oxidized cellulose being prepared by treating cellulose with nitrogen peroxide to give a carboxyl content of from 7 to 16 per cent, said aqueous composition having a solids content of about 50%.

Hydrogenation of Carbon Monoxide Polymers

U. S. Patent 2,495,292. Samuel L. Scott, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

A process for the treatment of interpolymers which comprises hydrogenating an ethylene-carbon monoxide interpolymer, having an ethylene/carbon monoxide ratio within the range of 1.3/1 to 45/1, in the presence of from 10% to 70%, based on the weight of the said interpolymer, of a hydrogenation catalyst, with hydrogen under superatmospheric pressure at a temperature within the range of 75° C. to 350° C., whereby a hydrogenation product comprising an ethylene-carbon monoxide polymeric chain with carbonyl groups reduced to secondary alcohol groups is obtained.

Polymerization Process

U. S. Patent 2,498,226. Bernard Thomas Dudley Dully, Ewell, England, assignor to A. Boake Roberts & Company Ltd., London, England, a British Company.

A process for the polymerization in aqueous dispersion of polymerizable compounds containing a terminal methylene group which comprises heating the dispersion for a period of time of from 1 to 24 hours in the presence of: (*a*) a sulphur compound selected from the group consisting of sulphites and free sulphur dioxide, said sulphur compound being dissolved in the aqueous phase of the dispersion; (*b*) oxygen to oxidise the sulphur compound; and (*c*) a salt selected from the class of metal salts that catalyse sulphite oxidation; and controlling the concentration of the oxygen available within the reaction sphere by carrying out the reaction in a closed space, and supplying an hourly rate of feed from 0.0004 to 0.05 part by weight of oxygen per 100 parts of weight of the compound to be polymerized.

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Testing by the National Bureau of Standards

Published by the National Bureau of Standards, U. S. Department of Commerce, Washington, D. C. Price 25 cents.

This circular fully describes the Bureau's test policy, presents general information on testing, and lists fees for most of the test work that is done.

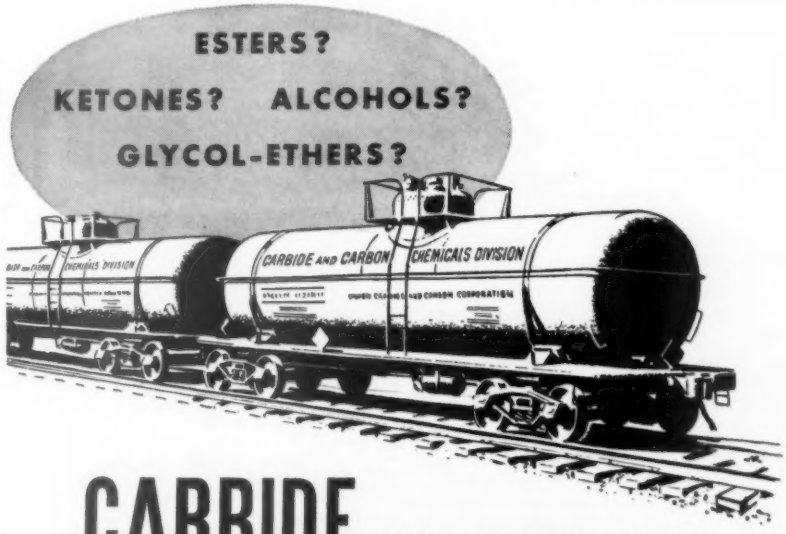
The Bureau's testing and calibration activities stem from its custody of the Nation's basic physical standards. Accuracy and uniformity in measurements throughout the United States depend on these standards, and Congress has therefore authorized the Bureau to engage in testing work for the Nation in those cases where devices or materials must be checked with the Bureau's standards or where sufficient accuracy cannot be obtained elsewhere. The National Bureau of Standards does not compete with qualified commercial testing laboratoriees, nor does it have the authorization, funds, or facilities to do general testing for the public. Fees listed include those for tests on electrical standards and instruments; standards of length, mass and time; pyrometers; fuels; radioactive standards; mechanical instruments; and optical instruments.

Carbon Monoxide Polymers

U. S. Patent 2,495,282. Paul Swithin Pinkney, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Delaware, a corporation of Delaware.

A thermosetting composition which comprises a mixture of formaldehyde and the product obtained by heating from 75° C. to the boiling point a solution containing a monoolefin/carbon monoxide polymer, a basic compound in amount of from 1% to 15% by weight of said polymer, and furfural in amount at least equal to the weight of said polymer, said composition containing said formaldehyde in amount of from 10% to 50% by weight of said polymer, said basic compound being selected from the group consisting of alkali and alkaline earth metal compounds, said polymer consisting of from 20 to 50 mol per cent carbon monoxide and from 80 to 50 mol per cent of polymerizable material consisting of a monoolefin containing from 2 to 4 carbon atoms.

LANCASTER, ALLWINE & ROMMEL
REGISTERED PATENT ATTORNEYS
•
Suite 424, 815—15th St., N.W.
Washington 5, D. C.
Patent Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions.
Booklet and form "Evidence of Conception" forwarded upon request.



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30 E. 42nd St., New York 17 UCC Offices in Principal Cities
In Canada: Carbide and Carbon Chemicals, Limited, Toronto

J. Albert Woods

J. Albert Woods Elected Pres. Commercial Solvents Corp.

J. Albert Woods was elected president of Commercial Solvents Corporation at a special meeting of the Board of Directors, it was announced recently by Major Theodore P. Walker, Chairman of the Board.

For many years Mr. Woods has been active in the agricultural chemical field, with experience in both production and sales. Prior to coming with Commercial Solvents, Mr. Woods was president of Wilson & Toomer Fertilizer Company, manufacturers of heavy chemicals, fertilizers and insecticides. He has also been a vice president and a director of the Armour Fertilizer Works, President of Chilean Nitrate Sales Corporation, and a vice president of W. R. Grace & Company.

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Huber Named to Market Div. of Hercules Cellulose Products

The appointment of Richard L. Huber to the product promotion and market development division of the Cellulose Products Department has been anounced by Hercules Powder Company. Frank Ketcham of the Detroit office will replace Mr. Huber as sales representative in the Cleveland area.

In his new position, Mr. Huber will remain in Cleveland, devoting his time primarily to market potentials in the Middle West. Among the products of the department are nitrocellulose, cellulose acetate, ethyl cellulose, chlorinated rubber, chlorinated paraffin, and sodium carboxymethylcellulose, also known as cellulose gum.

Meet

T. F. BRADLEY

The Mattiello Lecture Committee has chosen Mr. T. F. Bradley, of Shell Development Company, one of the country's leading authorities in the field of paints, varnishes and plastics, to deliver the Joseph J. Mattiello Memorial Lecture before the Federation of Paint and Varnish Production Clubs, at their annual convention this year. Mr. Bradley's lecture will cover the new developments in the technology of drying oils and varnishes, and will deal with new developments involving the chemistry and technology of fatty acids, polyols and esters.

Mr. Bradley attended Rensselaer Polytechnic Institute and Rutgers University, and began his career in the protective coating field in the Newark, New Jersey, laboratories of the Sherwin-Williams Company in 1920. From 1928 to 1943, Mr. Bradley was employed by the American Cyanamid Company as a research group leader. During the war he served in a technical capacity with the Technical Division, Chemical Warfare Service, Army of the United States, and was separated late in 1945 with the rank of major. with the Shell Development Company, Emeryville, California, where he is head of the Organic and Applications Department.

In 1946 Mr. Bradley lectured on "Chemistry of Drying Oils" in the Frontiers of Chemistry Lecture Series, at Western Reserve University, Cleveland, Ohio. In 1947 he was selected by a poll of the members of the Chicago Section, American Chemical Society, as one of the "ten ablest chemists and chemical engineers now working in the United States in the field of paints, varnishes and plastics". In April 1949, at the California Convention of the American Chemical Society in San Francisco, Mr. Bradley served as Chairman of the Paint, Varnish and Plastics Chemistry Division Symposium on the "Pacific Coast Coatings and Plastics Industries".

Mr. Bradley is a member of the American Chemical Society, the Golden Gate Paint and Varnish Production Club, and the Armed Forces Chemical Association.

Atlas Appoints Blacketer and Ariotti to Finishing Department

Atlas Powder Co. of Wilmington, Del. has named Charles W. Blacketer technical director of the industrial finishes department of the Stamford, Conn. plant, and Guido Ariotti as manager of the customer service department.

Mr. Blacketer joined the Stamford plant as manager of the customer service department after considerable experience with Berry Brothers and Diamond Alkali Co. Mr. Ariotti completed 25 years of service with the Atlas Powder Company last year.

•

Fisher Appointed by Haeuser

Warren C. Fisher has been appointed to the research and development staff of the Haeuser Shellac Co., Brooklyn, N. Y. Mr. Fisher is a graduate of Massachusetts Institute of Technology.

•

Continental Carbon to Increase Four More Furnace Black Units

Continental Carbon Company is planning to construct four additional high abrasion furnace black units. These new units will be designed to increase the company's output of furnace black by fourfold. Plant is located at Sunray, Texas.

•

Brown Appointed Chief Chemist At Egyptian Lacquer in N. J.

Mr. Royal A. Brown has been appointed to the office of Chief Chemist at The Egyptian Lacquer Manufacturing Company's New Jersey division.

This appointment climaxes Mr. Brown's fourteen years in the coatings industry, serving as a formulating chemist, chief chemist, and executive in charge of research and production.

Royal A. Brown

George H. Tulley

Tulley to Head Cleveland Office Of Metals Disintegrating Co., Inc.

Mr. H. E. Hall, president of Metals Disintegrating Company, Inc., Elizabeth, New Jersey, manufacturers of metal powders, pigments and abrasives, has announced the promotion of George H. Tulley to manager of the company's Cleveland office. Mr. Tulley will serve the company's customers in the metallic pigment field in the Cleveland territory at the same time retaining his position in the company as powder sales supervisor.

Coincident with this transfer of Mr. Tulley from headquarters of the company in Elizabeth, the Cleveland sales office of the company is being located in the Swetland Building, 1010 Euclid Avenue in that city. The telephone number there, Prospect 1-4092, will remain unchanged.

•

Nuodex Products Co. Receives Industrial Advertising Award

Nuodex Products Co., Inc., received an award of the month for one of the most outstanding product advertising campaigns submitted in the February contest held by the Industrial Marketers of New Jersey, the Jersey chapter of the National Industrial Advertisers of America.

The Nuodex campaign concerned the company's improved sulfate-free driers which contain less water soluble impurities than conventional driers. The promotion started at last November's Annual Paint Industry Show in Atlantic City where the Nuodex booth featured the new type driers.

Organic Coating Conference

The Gordon Research Conferences, sponsored by the AAAS, formerly known as the Gibson Island Research Conferences, for 1950, will be held from July 3 to September 1 at the New Hampton School, New Hampton, N. H.

These conferences were established to stimulate research in universities, research foundations and industrial laboratories. This purpose is achieved by an informal type of meeting consisting of the scheduled lectures and free discussion groups. Sufficient time is available to stimulate informal discussions among the members of a Conference. Meetings are held in the morning and in the evening.

Requests for attendance at the Conferences, or any additional information, should be addressed to W. George Parks, Director, Dept. of Chemistry, Rhode Island State College, Kingston, R. I. From June 20 to Sept. 1, mail should be addressed to Colby Junior College, New London, N. H.

Program for 1950 Organic Coatings Conference:

July 17—W. O. Lundberg. The Role and Mechanism of Oxidation in the Film Formation of Drying Oils.

July 18—A. K. Doolittle. Mechanism of Solvent Action and Film Formation. J. Kenneth Craver. Mechanism of Plasticization.

July 19—Daniel Smith. Rheology in Film Formation. R. H. Kienle. Factors in the Formation and Behavior of Pigmented Films.

July 20—E. J. Dunn, Jr. Reinforcement of Films by Pigments. W. K. Asbeck. Electrokinetic Properties of Pigment Dispersions.

July 21—H. F. Payne. Mechanism of Water Absorption and Diffusion. Chairman for this conference will be G. W. Seagren.

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Enamel Contract

The Department of Defense announced the recent award of contracts totalling $276,200 for the purchase of rust-inhibiting enamel. The contracts were let by Raritan Arsenal to Atlas Paint & Varnish Co., Irvington, N. J. and to Standard Paint & Varnish Co., New Orleans, La.

•

W. C. Hardesty Appoints Chicago Representative

W. C. Hardesty Co., Inc., manufacturers of fatty acid products, have announced the appointment of William E. Phillips, Inc., as their Chicago representative. W. C. Hardesty Co., Inc., will continue to carry warehouse stocks in Chicago from which deliveries can be made immediately.

Carpenter-Morton and Hilo Varnish Announce Merger

Merger of Hilo Varnish Corporation and the Carpenter-Morton Company of Boston, manufacturers for many years of a complete line of paints, varnishes and enamels has been recently announced.

The operations of Hilo will be continued with the backing of the added experience of the Carpenter-Morton Company. Hilo quality and Hilo service will be maintained.

•

Crown-Wittenberg Dissolved

The Crownoil Chemical Co., with offices and manufacturing facilities at 2–14 49th Ave., recently succeeded the Crown Wittenberg Chemical Corp., which has been dissolved.

Sales activities in the field of synthetic resins, drying oils and vehicles, manufactured or refined by the Crownoil Chemical Co., will be under the direction of George E. Hand, long known to the paint, varnish, lacquer and allied industries along the Eastern Seaboard.

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Shell Chemical Corp. Names E. Chester Peet Director

E. Chester Peet has been named a director of Shell Chemical Corporation. Peet is financial vice president of Shell Oil Company, parent company of Shell Chemical Corporation.

Peet began his Shell career in 1919 as a clerk in St. Louis. After advancing to the position of accountant and then assistant controller at that location, he moved to San Francisco as manager of the Auditing department in 1933. He subsequently became assistant treasurer there prior to coming to New York as assistant secretary and assistant treasurer in 1940. He was named vice president and treasurer in Shell's East of Rockies territory in 1944, and assumed his present overall financial responsibilities in January, 1949.

E. Chester Peet

Styrene Coating Talk Featured At Recent Exchange Meeting

The Paint & Varnish Exchange Club, Inc., met in the Taft Room of the Taft Hotel in New York City on the evening of April 18, 1950. Approximately seventy members and guests were present.

Benjamin Joachim, President, opened the meeting at 7:30 P.M. The minutes of the last meeting were read by Secretary Dana Johnson. As is his custom, Vice Pres. Jack Binswanger came in from Philadelphia to take part in the meeting. He introduced seven new members of the club. Committee reports were rendered by Dr. Walter Maass, Fred Gartenlaub, Dick Skolnick, and Jack Hathorne. Hi Morse, Chief Chemist of Peerless Paint & Varnish Co. and chairman of the Music Committee, asked that any amateur musicians who are interested in joining small musical groups get in touch with him. Mr. Gartenlaub reported on the progress his committee is making in establishing a means to help those who are unemployed seek a position.

The guest speaker was Mr. Kenneth V. McCullough, head of protective coatings development of the Bakelite Corp. His talk, entitled "Coating Resins Based on Styrene," embodied much new technical material and ideas. His talk was illustrated with panels and charts. Mr. McCullough was enthusiastically received and after the talk, he answered questions from the audience.

The member speaker of the evening was Mr. William N. McKee, Technical Sales Director of the W. A. Cleary Corp., manufacturers of soya lecithin. His talk on "Soya Lecithin and its Application in Paints" was flavored with humor and information.

Following the two speakers, there was a spirited open forum discussion dealing with poor quality paints as they affect the position of the chemist.

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Harley A. Nelson Dies

Harley A. Nelson, assistant to the general manager of the technical department of the New Jersey Zinc Co., New York died recently in Palmerton, Pa. He was 59 years old.

Mr. Nelson joined the New Jersey Zinc Co. in 1919 after serving for two years as assistant chemist in the chemistry division of the National Bureau of Standards.

C. Withington Co. to Represent Paint Raw Materials Suppliers

Chandler Withington has recently announced the formation of the C. Withington Co. in the field of sales representation. This firm will exclusively represent in the metropolitan New York area the American Alkyd Industries and the Troy Chemical Co., and have limited representation for Carbon Dispersions, Inc., and the Brown Oil and Chemical Co. Offices are located at 29–28 41st Ave., Long Island City, N. Y.

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Spencer Kellog Appointments

Spencer Kellog & Sons, Inc. has appointed Glen A. Spaulding to the newly created position of director of trade sales of its linseed oil division. Herbert L. Bayer has been named to succeed Mr. Spaulding as district sales manager in Baltimore, Md., and Stewart M. Rice will succeed Mr. Bayer as assistant district sales manager in the New York office, specializing in oils for the paint industry.

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Federation Awards Grant to University of Louisville

The Federation of Paint and Varnish Production Clubs has awarded a grant of $1,500 to the Speed Scientific School, University of Louisville, Louisville, Ky. for the continuation of research in the chemistry of paint and varnish films. The study covers changes in chemical composition of aging paint and varnish films, the change in polymerization, and the absorptive properties of solvent extracted film residues.

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For PROTECTIVE AND Decorative FINISHES
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NEW PRODUCTS & IMPROVEMENTS

A MONTHLY MARKET SURVEY

Fisher Scientific

ELECTRIC VISCOMETER
Centipoise Reading

Viscosity measurements directly in centipoise units are now provided by use of this electric viscometer. The instrument provides highly reproducible results, has unusual sensitivity over its full range, and is simple to operate, according to the manufacturer. It is useful for testing such widely diversified materials as glycerin and water or any liquid of the free-flowing Newtonian type. The patented Electroviscometer was designed and developed in the laboratories of the Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Penna. PVP—May.

PYREX BURET
Non-leaking

Manufactured of Pyrex tubing with permanently fused-in markings, absolute accuracy is obtainable with the Ultramex buret, according to the manufacturer. Valve arrangement integral with the tube is said to create a positive pressure seal, eliminating leakage and freezing of plug. Teflon plug within the valve provides for self lubrication. Buret is simple to clean and its parts are easily replaceable. Emil Greiner Co., 20–26 N. Moore St., New York 16, N. Y. PVP—May.

GRINDING MILL
Laboratory Model

Designated Model M midget processing mill is used to make laboratory batches of paints, inks, plastics and other materials. It is constructed of stainless steel and permits no contamination, according to the manufacturer. It is also adapted to the grinding and processing of certain anhydrous chemicals and earth materials. Capacity is 8 to 20 gallons or more per hour.

Complete details on the Model MS and other mills constructed for a wide variety of products may be obtained by writing Morehouse Industries, 1156 San Fernando Road, Los Angeles 65, California. PVP—May.

Crescent Truck

FORK TRUCK
Explosion-proof

Air operated "explosion-proof" fork truck is designed for use in small or restricted areas where explosion hazards exist, making it impossible to use either gasoline or battery powered trucks.

This fork truck operates from any air system at 90 to 100 p.s.i. pressure with a consumption of from 175 to 250 cubic feet per minute.

The truck is applicable in the chemical, paint, oil refinery, explosive industries. For complete information write the Crescent Truck Company, Lebanon, Pennsylvania. PVP—May.

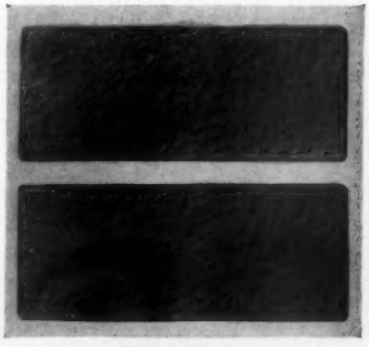
HAMMER FINISH
One-Coat Method

Reproducible hammer finish can be applied to metals with a one-coat spray using Duraplex C-55X and Parlon. Using the formulation below, the method entails careful but not difficult control of spray procedure and conditions. (See Photo below)

The formulation:

Material	*Pounds*
Parlon, 10 centipoise (22.1% solids in High Flash Naphtha)	60.5
Duraplex C-55X (70 % solids)	37.8
Alcoa Paste No. 1594	2.0
Butanol	2.0
6% cobalt naphthanate	0.24

In the laboratory program just completed, it was found that reproducibility of the hammer pattern is regulated by gun pressure, film thickness, set time and other factors. For best results, the coating should be sprayed at a viscosity of 62 seconds on a #4 Ford cup, using a #30 DeVilbiss air cap and a pressure of 15 psi through the feed cup. Atomizing pressure through the spray gun was 50 psi. Tinting pastes, added in extremely small amounts, accentuate the hammer effect. This finish dries tack-free in 60 to 90 minutes and shows a Sward rocker hardness of 26 to 30 after a 16-hour dry. Resinous Products Div. of Rohm & Haas Co., Philadelphia, Pa. PVP—May.



Resinous Products

NEW PRODUCTS

Brighton Copper

SYNTHETIC RESIN UNIT
Electrically Heated

A development in laboratory equipment for the paint, varnish and process industries is an electrically heated laboratory synthetic resin unit.

According to the manufacturer, it is designed to control through the following features: 1. Variable speed drive; 2. Type 316 Stainless Steel; 3. Pressure or Vacuum; 4. Temperature control by means of electronic thermometer; 5. Multi-tubular condenser and glass decanters for solvent method cooking; 6. All explosive proof electrical equipment; 7. Provision for cooling the batch.

This unit is designed as Brighton Model A-110 and further information on cost and delivery is available by writing to Brighton Copper Works, Inc. Cincinnati 14, Ohio. PVP—May.

PILOT PLANT AGITATOR
Uses Fluid Motor

Variable speed agitator of the hydraulic type for pilot plant and production use is said to be more flexible and safe than conventional types, according to the manufacturer. It is powered by a directly connected fluid motor, driven by an electrically operated hydraulic pump. Available in sizes from 1 to 50 hp. and has variable speeds ranging upwards from 15 rpm. Emerson-Sheuring Tank & Mfg. Co., Inc., 21st St., Martindale Ave., Indianapolis 7, Ind. PVP—May.

GAGING DRY FILMS
Improved Method

For measuring thickness of dry films on metals, foils, papers, and plastics, the Interchemical Direct Reading Thickness Gage method is employed.

Attached dry films are measured visually by means of an optical attachment to the gage plus a suitable light source. The film is stripped at two points about one-half inch apart and the two outside gage wheels rest on these stripped areas. Then the gage is rotated until its eccentric center wheel touches the film. A light source (placed behind the gage) permits observer to check the point at which center wheel meets the film and cuts off light. Direction of gage rotation can be reversed and the average of two readings used for great accuracy. Measurements are readily reproducible with sharp endpoints. Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Maryland. PVP—May.

ZINC OXIDE PIGMENT
For Alkyd Enamels

Zinc oxide developed for alkyd enamels is said to decrease indoor yellowing, aid in through-drying, increase toughness, and improve exterior durability. Designated "Kadox 515" this pigment is manufactured by the New Jersey Zinc Co., 160 Front St., New York 7, N. Y. PVP—May.

FOR THE BENEFIT OF MANUFACTURERS
AND USERS OF LACQUER

COMMERCIAL SOLVENTS CORPORATION

dedicates

THE HOT-LACQUER PROCESS

(U. S. Patent No. 2,150,096)

TO THE LACQUER INDUSTRY

Commercial Solvents Corporation is pleased to announce that, retroactive to January 1, 1950, it dedicates its patent on the hot-lacquer process to the lacquer industry—so that all may benefit by its free use.

This process can be adapted profitably in any application where lacquer is suitable, with the big advantage of substantially reduced finishing costs. Satisfactory equipment for applying hot lacquer is now available at reasonable cost from several manufacturers.

If you are not already familiar with this preferred process, we will be glad to send you detailed information.

CSC

INDUSTRIAL CHEMICAL DIVISION
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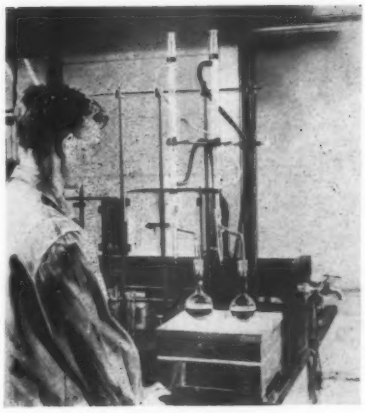
PRODUCTS: Ethyl Alcohol & Derivatives • Acetone • Butanol & Derivatives • Formaldehyde
Methanol • Amines • Nitroparaffins • Crystalline Riboflavin

NEW PRODUCTS



Fisher Scientific

LABORATORY HOT PLATE
Stepless Heat Control

Laboratory hot plate is said to provide stepless heat control. The "Temco" Hot Plate, after attaining a surface temperature of 500° F. consumes current only 50% of the time (unlike heaters employing rheostats). Temperatures can be maintained within close limits over the range 140 to 850° F. and the elements are of flat type which prevent "cold" spots. Fisher Scientific Co., 717 Forbes Street, Pittsburgh 19, Penna. PVP—May.

BUTYLATED UREA RESIN
Fast-curing

Known as Resimene U-901, this fast curing butylated urea-formaldehyde resin is said to impart high gloss and high hardness with exceptional freedom from cure pattern.

It is recommended in both topcoats and undercoats for metal finishing. Compatible with the usual types of short and medium oil length alkyd resins, the product also operates as a curing agent. The coating may also be used with the usual type resins in catalyzed, low-bake finishes.

In addition to rapid heat-conversion and high gloss qualities, other properties include absence of undesirable cure pattern, can stability, flexibility, color retention in white and pastel enamels and reasonably slow reducibility from package to application viscosity. Monsanto Chemical Co., Everett, Mass. PVP—May.

GLYCERYL RICINOLEATE
Lighter in Color

Glyceryl (Mono) ricinoleate S-1153, is a light yellow liquid, of low free fatty acid content and has a low solidification point, below −30°. Having a low freezing point, it is indicated for low temperature work and its insolubility in hydrocarbons makes it useful for oil resistant compounds, according to the manufacturer. It is used as an emulsifying agent and stabilizer for water-in-oil emulsions, and is compatible with, and may be modified with, catonic and anionic surface active agents for use as an emulsifier for oil-in-water emulsions.

Specifications and additional information are available from the manufacturer, Glyco Products Co., Inc., 26 Court Street, Brooklyn 2, N. Y. PVP—May.

RUBBER HOOD
For Chemical Operations

Coated with an improved type of rubber, this hood is said to be impervious to moisture, acids and caustics, oils and solvents. In addition, flexibility is retained giving it longer life, according to the manufacturer. General Scientific Equipment Co., 2700 W. Huntingdon Street, Philadelphia 32, Pa. PVP—May.

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MD-565W High total reflectivity, emphasizing diffuse characteristics; minimizes glare on outside applications.

MD-566 General purpose pigment for applications where high specular gloss is required.

MD-767 For extremely smooth finishes of a high specular gloss character.

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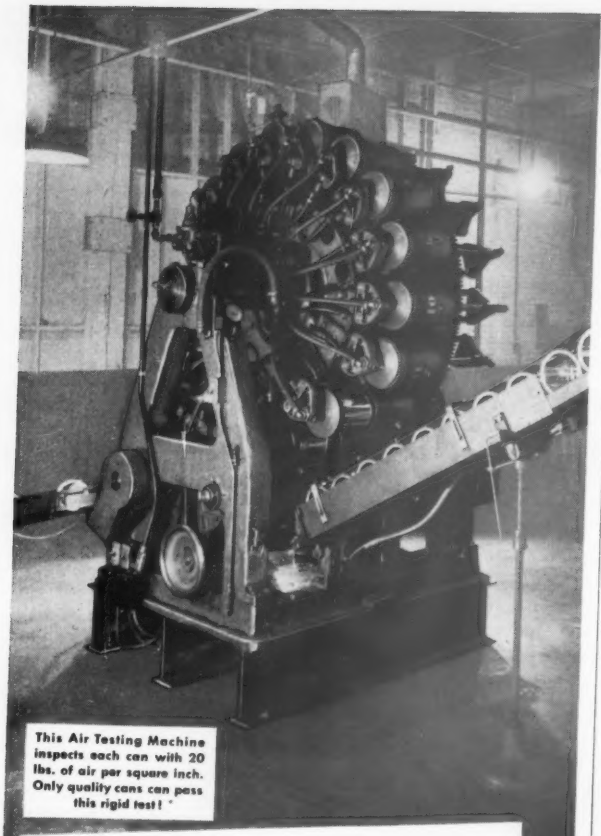

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TECHNICAL Bulletins

ACS PREPRINT

The preprint booklet containing the papers to be presented before the Division of Paint, Varnish and Plastics Chemistry at the Detroit Meeting, April 17–20, has been mailed to Division members in good standing. The Division dues for 1950 are $2.50 to members of A.C.S., and all Division members receive a preprint booklet for both Spring and Fall Meetings. A limited number of extra copies of the Detroit preprint are available at $1.25 to Division members, and $2.00 to non-members. The extra copies are available from the Secretary, H. F. Payne, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y.

CHEMICAL MOTORS

Four-page booklet B-4687, describing the new Life-Line chemical motors for operation in atmospheres where corrosive fumes and liquids are encountered, is available from Westinghouse Electric Corporation.

The booklet describes the internal construction features of these motors, plus the treatment of external parts for maximum corrosion resistance. Also included are the results of salt-spray corrosion tests, and tests comparing the relative corrosion of shot-blasted cast iron and machined steel. For a copy of booklet B-4687, write Westinghouse Electric Corporation, P. O. Box 2099, Pittsburgh 30, Pennsylvania.

POLY-PALE RESIN

A new booklet describing the uses of Poly-pale Resin in protective coatings has been published by Hercules Powder Company. The booklet includes a table of typical physical and chemical properties of the resin, as well as a listing of its general properties.

Poly-pale Resin has a variety of applications in the protective coating field. The booklet gives up-to-date information on its use in esters, maleic-modified and phenolic-modified resins, and in varnishes, metal resinates, gloss oils, tung oil varnishes, and tung oil limed rosin varnishes.

The booklet explains that Poly-pale Resin is made by treating natural rosin to cause a portion of the unsaturated rosin acids present to unite as polymers. This polyemrization increases the softening point and viscosity of the resin, while unsaturation is lowered and oxidation tendencies are decreased.

TAR ACIDS

Data sheets tabulate properties of various tar acids available from the Koppers Co., Inc., Tar Div., Pittsburgh, Pa. It also explains the uses of these acids in synthetic resins.

COATING RESINS

Durez Plastics & Chemicals, Inc., North Tonawanda, N. Y., has compiled technical data on Durez 220 and 220-V which are used in the protective coatings industry. Properties, compatibility with drying oils, and suggested cooking methods to be employed with various soft and hard oils

GOLD DISPERSIONS

The R-B-H Dispersions Div. of Interchemical Corp., Bound Brook, N. J., has published a 2-page bulletin on gold dispersions which have been developed to fill a need for transparent, light-fast coating materials that would produce a rich gold-like effect when applied over metallic surfaces. Formulation of this gold dispersion in nitrocellulose lacquer, alkyd resin enamels, oleoresinous varnishes and wood stains are given.

INDUSTRIAL ELEVATORS

Thirty-six page bulletin describes portable, hand and electric-operated elevators; barrel and drum elevators, including tilting models; pallet elevators; four post types; platform loading and balcony elevators; cranes and electric hoists, etc. These are illustrated in detail, including their safety features; cable safety device, gears, etc. Write to the Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.

WATERGROUND MICA

Six-page bulletin describes industrial applications and uses of water-ground mica as a raw material in primers, sealers, traffic paints, casein and emulsion paints, flat finishes, texture paints, bitumastic products, and aluminum paints. Various types are discussed together with a tabulation of the physical and chemical properties of this material. Special attention is given to the use of mica in the formulation of outside house paints. Write to the The English Mica Co., Sterling Building, Stamford, Conn., for your copy.

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RESIN GUIDE

The second issue of Cyanamid's "Resin Guide," devoted exclusively to tabulating the specifications for the resins it manufactures for use in paints, varnishes, lacquers and printing inks, has just been announced by American Cyanamid Company. The first issue, released in November, 1949, is now obsolete.

Designed to keep the formulator up-to-date on the resins available from the Company, the "Resin Guide" is tabular in form and designed for quick, easy reference. The resins outlined in the guide include various grades in each of the melamine, urea, alkyd, copolymer, phenolic, and dibasic-acid families; detailed literature on individual resins is also available. Copies of the revised "Resin Guide" may be obtained from American Cyanamid Company, Coating Resins Department, 30 Rockefeller Plaza, New York 20, N. Y.

STOCK PIGMENTS

The Claremont Pigment Dispersion Corp., 110 Wallabout St., Brooklyn, N. Y. has recently issued a new catalog listing 500 stock pigment pastes used in paints, varnishes, and lacquers. Styrenated alkyd dispersions which have passed extended shelf stability tests are also covered.

TESTING EQUIPMENT

Four page folder lists laboratory testing equipment available for the coatings industry. Check list provides hasty means in providing the manufacturer with accurate information on type of equipment one needs for his purposes. Henry A. Garner Laboratory, 4723 Elm St., Bethesda 14, Maryland.

ALUMINUM PAINT

A comprehensive, 32-page brochure for industrial users of aluminum paint is being distributed to thousands of manufacturers by Aluminum Company of America, Pittsburgh 19, Pa.

The new ALCOA publication points out that while the company does not make or sell aluminum paint, it feels obligated to explain how aluminum paints can be used to best advantage.

HEXYLENE GLYCOL

"Hexylene Glycol," a new booklet is now available on letterhead request from Shell Chemical Corporation, 500 Fifth Avenue, New York 18 or 100 Bush Street, San Francisco 6.

The booklet describes solvent power, coupling ability, and other general properties of hexylene glycol, a petroleum-derived organic chemical. Commercial applications of the product are discussed with emphasis on brake fluids, printing inks, wood preservatives, soluble cutting oils, and cleaning compounds. Physical properties are included, along with a table on the solubility of various materials in hexylene glycol.

FATTY ACIDS

A new 24-page fatty acid specification Catalog has just been made available by W. C. Hardesty Co., Inc. The catalog lists complete specifications and shipping data on a complete line of fatty acids which include stearic acid, red oil, animal and vegetable and fish oil fatty acid, stearine pitch and glycerine. Also included are three data charts showing composition of fats and oils, color standards comparator and temperature conversion tables.

A copy of the Hardesty Fatty Acid Catalog may be obtained by writing the company at 41 East 42nd Street, New York 17, N. Y.

Hot Lacquer is Hot News!

CAN IT HELP YOU BOOST INDUSTRIAL SALES?

The biggest news in lacquer today is hot spray! Industry is accepting hot lacquer for the savings it offers in material costs and application time, and for the increased production and better finishes it affords.

It will pay you to consider the many additional sales you may gain by adding hot lacquer to your line.

A 4-page leaflet describing hot lacquer's many advantages has been distributed by Hercules to key industrial users. We will be glad to supply you with additional copies for your customer and prospect lists.

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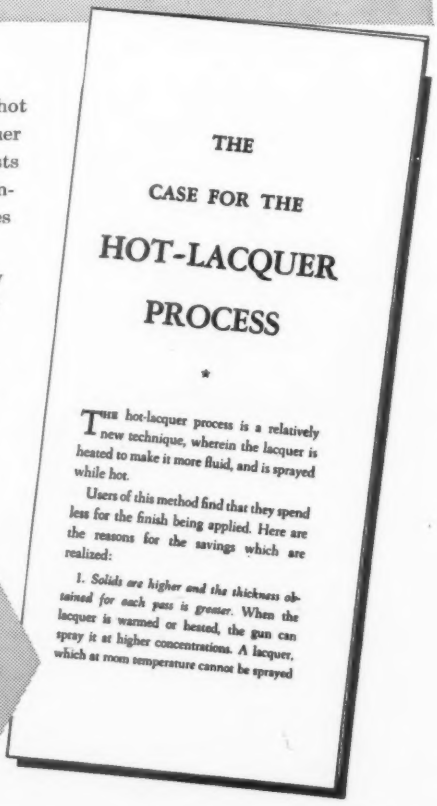
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THIS hot-lacquer process is a relatively new technique, wherein the lacquer is heated to make it more fluid, and is sprayed while hot.

Users of this method find that they spend less for the finish being applied. Here are the reasons for the savings which are realized:

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CLUB NEWS

KANSAS CITY

The April meeting of the Kansas City Paint & Varnish Production Club was called to order by President Koehn at 6:45 o'clock Thursday evening April 13th, at the Pickwick Hotel, with 32 members and guests present.

In the form of new business Mr. H. E. Hancock made a motion that a committee be appointed to meet with the Kansas City Architectural Association committee to arrange for a joint meeting with that group sometime in the Fall of 1950. The motion was approved, and a committee consisting of H. E. Hancock, W. W. Vasterling, and R. Van Deutekom was appointed.

Mr. H. M. Johnson of the Nuodex Company was introduced by President Koehn as the speaker of the evening, and delivered a speech on the anionics of dryers.

BALTIMORE

The April meeting was held on April 14th in the Pine Room of the Sheraton-Belvedere Hotel, by President Ruben. Previous to the beginning of the business meeting dinner had been served to 53 guests and members. Immediately after dinner President Ruben introduced Mr. Fred S. Greenewald of the Nuodex Products Company who spoke on "Spotlighting Variables in Drying Performance." Mr. Greenewald discoursed on the effect of difference in tack-free time of several standard films as temperature, light, soak period of dryer, etc. were changed under controlled conditions. The results of his investigation were presented to the club members in a bulletin. It was also stressed that a reliable, reproducible test for tack-free time is necessary.

NEW YORK

Two hundred and two members and guests attended the regular April meeting of the New York Paint and Varnish Production Club held at 2 Park Avenue, New York City.

The evening's program was highlighted by two guest speakers. Mr. A. T. Montanye, President of the Federation of Paint and Varnish Production Clubs and Dr. H. S. Davidson of the Imperial Paper and Color Corporation.

Dr. Davidson started his letcure with a slide showing a comparison of a light illuminated microscope against an electron microscope. He then pointed out that erroneous results are possible when either instrument is used at its maximum power. Apparent size and shape of particles are sometimes indefinite and misleading. This peculiarity was shown by comparing micrographs of the same material under the two different sources of magnification. The electron microscope gave a clear cut picture of the particles at a low order of magnification possible with the instrument. By means of panels and slides, Dr. Davidson pointed out the significance of the differences in particle size, shape and size distribution and how these effected the final pigmentary characteristics.

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HOUSTON

The Houston Paint & Varnish Production Club held its regular monthly meeting in the Texas State Hotel dining room on the evening of March 14th. After an excellent steak dinner and the business discussion, Mr. Clovis Adams of the Sherwin-Williams Company addressed the club. Mr. Adams illustrated his talk on "Co-fumed Leaded Zinc Oxide" with slides and actual panels. He concluded that co-fumed leaded zinc oxide had marked advantages in mildew resistance and durability over mechanically blended lead and zinc pigments. Mr. Adams also discussed progress in house paints in the past 15 to 20 years and the superior quality of postwar formulations.

NORTHWESTERN

Fifty-five members and guests were present at the April meeting at the Town and Country Club at which Vice President Carlson officiated.

It was announced that Mr. McCullough of the Bakelite Corp. would speak at the next meeting.

There being no further business to consider, the meeting was turned over to Mr. Lee Andrews of the DuPont Company who gave a slide illustrated talk on "Formulation of Phthalocyanine Finishes." Mr. Andrews described the newer improved phthalocyanine pigments which do not recrystallize in enamels and hence do not lose color strength. Flocculation with its attendant loss of color strength is influenced by the solvent used in the grind, the oil, and oil length of the vehicle. Many large beautiful sunburst color panels showing durable combinations of phthalocyanine green and blue with white, aluminum, "Green Gold," and "Platinum Violet," were exhibited.

DETROIT

The Detroit Paint and Varnish Production club held its regular meeting on April 18th. Guest speaker was Arthur Minich of the Nuodex Products Co., who is in charge of research.

Dr. Minich spoke on the "Anionics of Driers" pointing out that at the present time there is considerable speculation on the mechanism of drier action. Dr. Minich's approach in regard to the theory and mechanism of drying was chiefly concerned with the anion portion of the drier molecule showing its effect on the drying action of certain types of paint films.

CALENDAR OF EVENTS

May 15–17. National Cottonseed Products Association Meeting, Shamrock Hotel, Houston, Texas.

May 28–31. American Institute of Chemical Engineers, Regional Meeting, New Ocean House, Swampscott, Mass.

June 12–16. Conference on Industrial Research, Columbia University, New York, N. Y.

June 26–30. 1950 A. S. T. M. Annual Meeting and Exposition of Testing Apparatus and Equipment, Chalfonte-Haddon Hall, Atlantic City, N. J.

Sept. 3–8. American Chemical Society, 118th National Meeting, Chicago, Ill.

Sept. 5–9. National Chemical Exposition, Coliseum, Chicago, Ill.

Sept. 18–22. National Instrument Conference and Exposition Buffalo, N. Y.

Sept. 26–29. Industrial Packaging & Materials Handling Exposition, Philadelphia, Pa.

Oct. 16–20. National Safety Congress, Chicago, Ill.

Oct. 18–20. Society of the Plastics Industry, New Ocean House, Swampscott, Mass.

Oct. 23–25. Packaging Institute, Annual Forum, Commodore Hotel, New York, N. Y.

Nov. 9–11. Federation of Paint and Varnish Production Clubs Convention, Congress Hotel, Chicago, Ill.

Nov. 15–18. National Paint, Varnish and Lacquer Association Convention, Fairmont Hotel, San Francisco, Calif.

CLASSIFIED ADVERTISEMENTS

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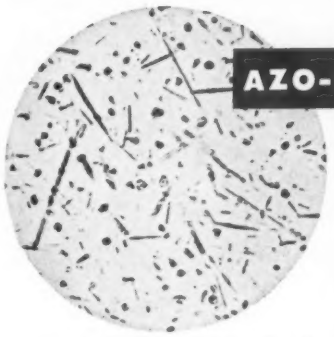

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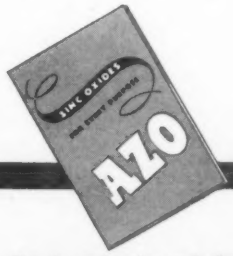

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Titre	(73.4 - 78.8° F) 23.0 - 26.0° C
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Iodine Value (Wijs)	minimum 125
Free Fatty Acid (as oleic)	98 - 100%
Acid Number	195 - 199
Saponification Value	196 - 200
HEAT STABILITY: After heating to 235° C for five hours with CO_2 Color-Gardner Standards 1933	5 - 7

HARDESTOIL 16

Titre	(42.8 - 48.2° F) 6.0 - 9.0° C
Color-Gardner Standards 1933	3 - 5
Iodine Value (Wijs)	minimum 135
Free Fatty Acid (as oleic)	96 - 98%
Acid Number	191 - 195
Saponification Value	192 - 196
HEAT STABILITY: After heating to 235° C for five hours with CO_2 Color-Gardner Standards 1933	5 - 7

The light color of every drum of Hardestoil 15 and Hardestoil 16 proves their superior advantages in alkyd resins for protective coatings. Hardestoil 15 is specially formulated for use in production of rapid-drying, high gloss, durable primers, surfacers, outside and interior enamels, finishes and water emulsion paints. Hardestoil 15 and Hardestoil 16 bring new adhesive and weather-protective values to your coating, and offer increased protection economically. Where high iodine and low titre are requisites, specify Hardestoil 16.

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